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VANADIUM-
ALLOYS STEEL CO., Pittsburgh, Pa.

(Note:—Orders and inquiries should be directed to Vanadium-Alloys Steel Company . . . 1440 W. Randolph Street, Chicago, Ill.)

December 29, 1934

AUTOMOTIVE INDUSTRIES

THE AUTOMOBILE

Volume 71 Number 26
Reg. U. S. Pat. Off

JULIAN CHASE, Directing Editor
DON BLANCHARD, Editor
P. M. HELDT, Engineering Editor
JOSEPH GESCHELIN, Eng. Editor
ATHEL F. DENHAM, Detroit Editor
JEROME H. FARRIS, Ass't Editor
T. LAWTON SLAUGH, News Editor
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Airstream Six With Independent Front Suspension Added by DeSoto for 1935	804
New Developments	808
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Automotive Industries is published every Saturday by
CHILTON COMPANY (Pa.)
Chestnut and 56th Streets, Philadelphia, Pa.
C. A. MUSSELMAN, President and General Manager
W. I. RALPH, Vice-Pres. G. C. BUZBY, Vice-Pres.
J. S. HILDRETH, Vice-Pres. and Director of Sales
W. A. BARBER, Secretary and Treasurer

OFFICES

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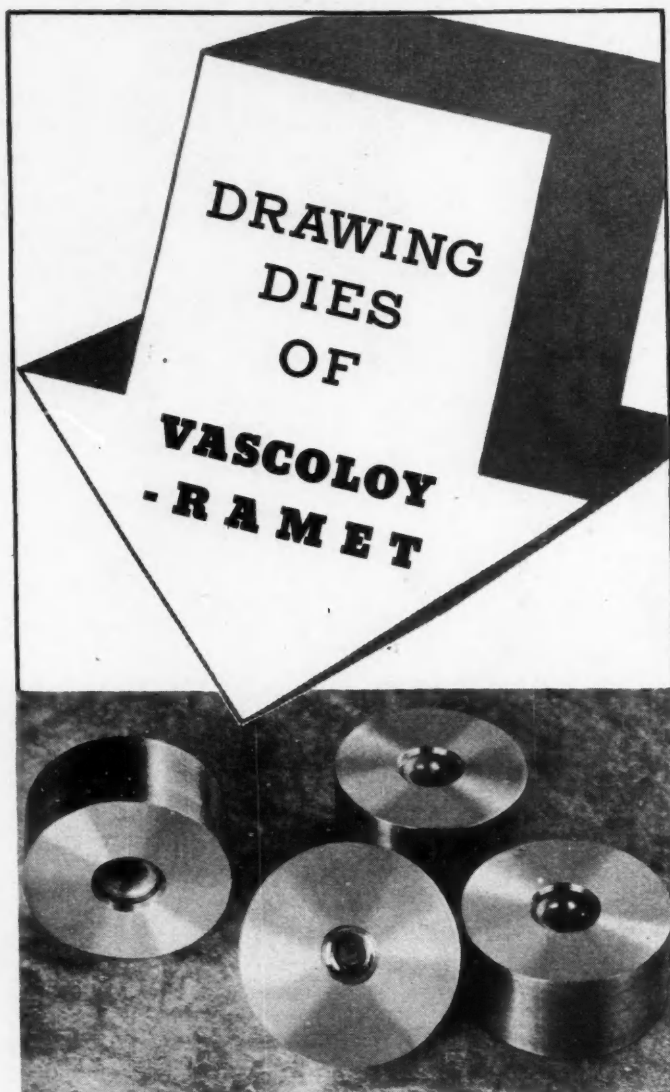
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Automotive Industries

1934 Registrations Up 4.6%

U. S. Total Is 24,952,007; First Increase Since 1930

by Marcus Ainsworth

Statistician, Automotive Industries

Registrations of motor vehicles in 1934 show an increase over the preceding year for the first time since 1930. According to a preliminary survey made by *Automotive Industries*, 24,952,007 cars, trucks and buses were registered in the United States as compared with 23,849,932 in 1933, a gain of 4.6 per cent.

The increase was broadly distributed as in only two states—Illinois and South Dakota—do the preliminary figures indicate that 1934 registrations failed to reach the 1933 totals. In these states, the losses amounted to but fractions of one per cent so that final figures may well show increases for all states. Montana has the largest percentage gain with 18.1 and was followed by Georgia and Florida with 17.4 and 16.5 per cent increases respectively.

New York held first place in point of total registration by a comfortable margin, with 2,300,000 in 1934 against 2,245,619 last year. California was second followed in order by Pennsylvania, Ohio, Illinois, Texas and Michigan, all with more than a million registrations.

Passenger car registrations increased 5.0 per cent from 20,557,493 last year to 21,584,193 in 1934. The increase in truck registrations was smaller, 2.3 per cent, the 1934 and 1933 totals being respectively 3,367,814 and 3,292,439.

Complete registration data by states are presented in tabular form on page 800 of this issue.

Advance Orders Boost Studebaker Production

The reception given the new 1935 Studebaker cars has brought about increased production at the Studebaker plant in South Bend and three eight-hour shifts are now working, according to Paul G. Hoffman, one of the three trustees of the corporation. Especially strong is the demand for the higher

priced eight-cylinder cars, Mr. Hoffman said.

More persons are now employed at the Studebaker plant than at any other time during the past five years. Nearly 8,000 are on the pay roll. Inability to fill some 1500 orders was disclosed by Mr. Hoffman, when he announced that these orders would have to be carried over until January. Total production for December will reach 6,500 units, Mr. Hoffman said, as compared with 5000 units in the same month last year.

Colpitts on Budd Board

Walter Colpitts, of the engineering firm of Coverdale & Colpitts, of New York City, has been elected a director of the Edward G. Budd Manufacturing Company and a member of the executive committee.

1935 Pontiacs Have Steel Tops, Silver Alloy Rod Bearings, Hydraulic Brakes

PONTIAC, MICH., Dec. 29—Pontiac Motor Company's 1935 motor cars, featuring an entirely new line of sixes in addition to an improved straight eight, were announced today in a limited number of cities throughout the northeastern part of the country.

The sections in which the announcement is made today embrace the territories covered by the Boston, New York, Philadelphia, Washington, Pittsburgh, Buffalo, Cleveland and Detroit zones.

Ford Passenger Car Prices for 1935

	United States 1935 change	Canadian prices
Five window coupe...	\$495 — \$10	\$645
Tudor Sedan	510 — 10	665
Fordor	575 None	750
Deluxe 5 window coupe	560 + 15	...
Deluxe tudor sedan...	575 + 15	730
Deluxe fordor sedan..	635 + 20	810
Fordor touring sedan		
with trunk	655 ..	830
Cabriolet	625 + 35	815
Tudor touring sedan		
with trunk	595 ..	750
Deluxe three window		
coupe	570 + 25	720
Deluxe Phaeton.....	580 + 30	725
Deluxe roadster	550 + 25	715
Sedan delivery	585 + 20	*
Station wagon	670 + 20	870

* Not announced.

Report Holley Co. Will Quit Carburetor Field

It is reported by unofficial sources, but believed to be reliable, that the Holley Carburetor Company is planning to abandon the carburetor business and that this phase of the company's activities will be assumed by a new company.

It is also reported that M. E. Chandler, vice-president and general manager of Bendix-Stromberg Carburetor Co., and W. B. Groves, manager of Detroit office for Bendix, have resigned their affiliations, and will head the new organization which will devote itself exclusively to engineering development, manufacture and sales of carburetors for the automotive industry. It is expected that some form of official announcement may be available before the first of the year.

Announcement will be made in all other parts of the country January 5.

Prices on the Pontiac Six approach the lowest in the industry. Overall length of the Six is 187 inches while that of the Eight is 192 inches. Standard Six models will come in five body styles; the deluxe Six and the Straight Eight in seven body styles, including coupes, two-door and four-door sedans and touring sedans.

Many improvements and refinements



Frontal Appearance of the 1935 Pontiacs

are found in both lines of cars. Most noteworthy, no doubt, are the new solid-steel turret-top body developed in conjunction with the Fisher Body Corporation, and the adoption of hydraulic brakes.

Additional features include built-in luggage space; concealed spare tire; greater body room; silver alloy connecting rod bearings and an improved method of mounting the knee-action assemblies.

Australia Alters Tariff, Should Benefit Canada

Canada's trade with Australia should be further improved by the changes in the tariff made in the budget recently brought down in the Australian Parliament. A study of the revisions by tariff experts of the Department of Trade and Commerce in Ottawa, Ont., shows that on many items the preference to British countries has been substantially widened. Many changes have been made in automobile engine parts, most of them now bearing an import of 25 per cent, under British Preference, and 53¾ per cent, general. The old rates were 45 per cent, and 65 per cent.

NRA and FTC Differ on Basing Point System

The staffs of the NRA and Federal Trade Commission met last Friday to consider their respective reports on the steel basing point system. While nothing of what transpired at the meeting was revealed, it is presumed that the meeting was devoted to an effort to reconcile the divergent views of the two government agencies.

December 29, 1934

Ford Invites Repairmen to New Model Preview

One of the features of the Ford pre-announcement program were invitations sent to independent repairmen all over the country asking them to attend previews of the new models in branch cities on Friday of this week. Business leaders, fleet operators, etc., were also invited to these showings.

On Thursday, previews were held for the press at Dearborn as well as in the various branch cities. At these showings dealers and their guests heard Henry Ford, Edsel Ford, Wallace Campbell, L. C. Sheldrick, R. H. McCarroll and W. C. Cowling over the telephone.

White Motor Co.

The White Motor Company reports a net loss of \$1,143,627 for the nine months of this year ending Sept. 30. This total is after expenses, depreciation, repairs, replacements and other charges have been deducted from earnings.

Industry's Progress in 1934 Reflected by Output, Sales, Employment, Purchases

by Don Blanchard

Editor, Automotive Industries

The automotive industry made progress on all fronts in 1934.

It produced more, sold more, bought more, employed more, paid more wages and its products were used more.

Perhaps the most direct measure of motor vehicle use is gasoline consumption and it now appears that something over six per cent more fuel was burned this year than in 1933—approximately 900,000,000 gals. This means that car and truck mileage in 1934 went up approximately in proportion, and that the potential market for maintenance and for new vehicles was increased accordingly.

Production in 1934 will total around 2,850,000 units as compared with 1,986,000 last year, a gain of 43 per cent. Output of passenger cars increased 39 per cent to 2,260,000 while truck production increased 51 per cent to 590,000. These are the largest totals returned by the industry since 1930.

Similar gains were registered in domestic retail sales. Passenger car deliveries totaled 1,886,000 against 1,494,000 last year for a gain of 26 per cent, and truck sales were up 65 per cent to 405,000. Total domestic sales of cars and trucks approximate 2,291,000 against 1,740,000 in 1933, an improvement of 31 per cent.

Foreign sales, including Canada but excluding about 90,000 vehicles assembled abroad, jumped from 177,000 units in 1933 to 354,000, an increase of 100 per cent. Sales of

passenger cars in foreign markets increased 95 per cent while truck business rose 111 per cent.

Stocks of cars in the hands of dealers in the United States increased approximately 200,000 units during the year. The conditions were unusual, however, because at the first of the year the cupboard was practically bare on most lines due to last year's tool and die strike, whereas this year a number of important makers got under way in December and as a result their dealers had 1935 models in stock as the year ended.

These volume figures also reflect in a general way the extent to which the industry increased its purchases from other industries and also the additional jobs it provided. Payrolls may be expected to show a somewhat larger rise than volume, when final figures are available, due to substantial increase in wage rates effected during the year.

Profits in 1934 probably were somewhat larger than in 1933—but not nearly so much larger as the increase in volume would indicate. Responsible for this situation, of course, is the fact that costs went up faster than expanding volume cut overhead costs and out of all proportion to price increases which the industry could get from the public without seriously curtailing volume.

Due to the fact that low-priced cars again dominated the market, vehicle manufacturing profits were confined largely to the "big three" with most of the independents in the red. In the parts field, profits were more broadly distributed among the different suppliers.

Automotive Industries

Cadillac Men Name Fellow Workers to Represent Them on Bargaining Agency

Analyzing recent primary election of workers at the Cadillac plant one fact is outstanding. Those who voted, representing by far the majority of eligible voters, seem to have been well satisfied with previous management worker relations as carried on by the works council. Of the 16 first place men nominated from the 16 voting districts, 11 are on the present works council, two were former council men and one was a runner up at the last council election. Only one new man was added to the list.

Father Coughlin was nominated in one district where he ran second high in the voting. He has declined the nomination, however, so the third highest man in the district will take his place.

Of the total of 32 first and second place nominations there were only three new names aside from the undecided four ties in the second place nominations. Thirteen present works council men were nominated out of the total of 16 on the present council, a complete vindication by the workers themselves of the principle of group representation by individuals rather than by organizations, since the works council has been made up of representatives out of the shop from each district so that each representative was intimately acquainted with problems of specific smaller groups of workers.

The fact that the selected representative acting as an individual means more to the worker than the organization he is affiliated with is borne out by the small vote—only 150—designating desires for works council affiliation in spite of reelection of the majority of works council members.

Apparently only one A. F. of L. man was nominated, who at the same time was designated as an A. F. of L. man although at least three men who happen to be A. F. of L. members were nominated. This is easily understandable since the works council formerly also had A. F. of L. members in its makeup. Renomination of these men therefore indicates more their effectiveness as works council representatives than any desire to have representatives affiliated with the A. F. of L.

On the final board there will probably be one "designated" A. F. of L. man since 94 votes were cast asking for such a designation out of a total of 1593 ballots and since proportional representation will be figured on the basis of votes cast rather than eligible voters.

Out of 2330 eligible voters 1620 were working at the time the election was held. Of this group 1340 cast ballots, or 83 per cent. It may be assumed that of the 280 non-voters in this group the majority were A. F. of L. members following instructions not to vote. The latter total however is small.

Of the 753 eligible non-workers only 253 appeared at the plant to cast ballots, probably largely due to bad weather conditions prevailing. It would not be sound to assume, however, that a similar large proportion of

this group of 500 non-voters were A. F. of L. members.

Irrespective of proportions the majority by far of eligible voters cast ballots so that if the A. F. of L. should continue to fight for majority rule and achieve their ends in this case, nothing would be achieved by A. F. of L. theoretically except elimination of the single designated representative on the board of representatives.

M. E. S. A. with 20 "designations" on ballots probably will not be entitled to a representative. M. E. S. A. also had instructed its members not to vote in the election.

It is assumed that both A. F. of L. and M. E. S. A. instruction in this respect will hold for the final election Friday. Representatives will then be chosen from the nominations by vote of the entire plant rather than by districts.

From the standpoint of industrial significance the final election Dec. 28 is relatively unimportant compared with the vote in the primary. In the latter workers were given virtually free choice to pick the type of representation they wanted and they picked representation by individuals with whom they worked, whom they knew and could trust, and who could understand, sympathize with and try to improve the lot of the individual worker rather than that of workers as a mass.

In this respect it seems to be a vindication of the theory that the problem of industrial relations is not so much the dealing with workers as a mass as it is with workers as individuals. That the workers themselves also feel the same way is indicated by the Cadillac vote.

Thomas Midgley

Thomas Midgley, who was connected with the tire and rim industry since the early days of the automobile, died at Bradentown, Fla., recently, at the age of 74 years. He was the father of Thomas

Midgley, Jr., inventor of ethyl fluid.

Mr. Midgley was born in England and came to this country as a boy. He entered the bicycle industry in Columbus, Ohio, where he joined the Columbus Bicycle Co. When the automobile began to arouse public interest he entered that field. He organized the Midgley Manufacturing Company in Columbus to manufacture tires and rims. This business was later taken over by the United States Tire Company, and Midgley then became president of the Hartford Rubber Works, a subsidiary of the United States Tire Company. For a great many years Mr. Midgley was connected with the Fisk Rubber Company of Chicopee Falls, Mass., as head of the development department. He retired from this position in 1927 and since that time had been making his summer home in Chicopee Falls and his winter home in Bradentown, Fla.

Stephen D. Bryce, Jr., Wed

Stephen D. Bryce, Jr., manager of the Information Department of the Automobile Manufacturers Association, and Miss Georgia Ruth Elder, Toledo, Ohio, were married last week by the Rev. George M. Duff in Riverdale (N. Y.) Presbyterian Church.

Chevrolet Starts Up

Chevrolet went back into production this week in Flint and in one or two other assembly plants. Most plants will be in operation next week.

Automotive Indexes

(Federal Reserve Board)

	1923-1925 = 100		
	Nov., 1934	Oct., 1934	Nov., 1933
Production	24	38	19
Employment	67	69	67
Payrolls	51	52	40
Adjusted for seasonal production	37	41	30
Employment	70	69	60



Cadillac employees vote in A.L.B. sponsored election

Deflationary Forces Spent, Sloan Says, Anticipating Accelerated Recovery

Believing that the trend of our national thinking is gradually becoming more harmonious with natural economic laws and that the deflationary forces of the depression have largely spent themselves, Alfred P. Sloan, Jr., General Motors president, in his New Year's statement says that "conditions in 1935 should be somewhat better than in 1934. My belief is that they will be better."

Mr. Sloan's statement follows:

"I have for some time past contended that there is very definite evidence that the deflationary forces, which have played so important a part in the world's industrial depression, largely spent themselves in the summer of 1932 and that slowly but surely there has been developing since that time a foundation for world recovery. I might call that 'Fundamental No. 1.'

"Next, we must appreciate, and this fact is frequently forgotten, that it is impossible to violate successfully natural economic law, although we can formulate economic policies that modify the effects of such law. These policies can accelerate or decelerate the normal process of depression and recovery. Applying this thinking to the economic policies of the United States and limiting the discussion to such policies as affect industry, in which I am more directly concerned and have better opportunity for observation, I am inclined to think that what we have done has been, on the whole,

more harmful than beneficial. We have decelerated rather than accelerated the normal processes of recovery. That is 'Fundamental No. 2.'

"I am convinced, hence I am encouraged, and I believe all have a right to be encouraged, over the fact that there is developing at the moment a sounder approach to the solution of these vital problems. Our thinking is becoming more in harmony with the natural economic law to which I have previously referred. There is a greater appreciation of the importance of the wealth-creating pay-roll, a yardstick that measures our progress toward recovery, as distinguished from the unproductive pay-roll, which adds to our future burdens and, if continued too long, ultimately leads to bankruptcy. If I am correct in my evaluation of the present trend of thought and that trend is interpreted either into action or lack of action, and one is as important as the other, then we can proceed down the road that leads to sound recovery with real confidence and at an accelerating rate. That is 'Fundamental No. 3.'

"I have stated the fundamentals as I see them. The question next arises as to the interpretation of these fundamentals. The fact that there is a foundation not only for recovery but the possibility of accelerating the processes of recovery, and a broadening intelligence as to the principles involved in the solution of the component problems, justifies the belief that we are making progress, and that conditions in 1935 should be

somewhat better than in 1934. My belief is that they will be somewhat better, but that belief is definitely predicated upon the conviction that the essential things to encourage and promote creative effort will be done, and that the contrary will not be done. To my mind, that is the real question involved in the problem."

Wallace, Blank Promoted By Marmon-Herrington

Two promotions in the factory organization of the Marmon-Herrington Co., Inc., have been announced by A. W. Herrington, president. Robert C. Wallace, service manager, has been advanced to assistant chief engineer, working under Mr. Herrington, who in addition to being president of the company also is chief engineer.

The second promotion announced is that of Harold B. Blank from assistant service manager to service manager, to fill the vacancy created by the advancement of Mr. Wallace.

Met. Section, S.A.E. To "Pre-View" Show

Announcement has been made of a previously unscheduled meeting of the Metropolitan Section, Society of Automotive Engineers on the evening of January 3, arranged as a "pre-view" of the New York Automobile Show, which opens two days later. Austin Wolf, consulting engineer, will discuss the engineering features of the various new cars announced up to the date of the meeting, which will include nearly all of the prominent makes. Mr. Wolf's paper will give the section members an authoritative analysis of engineering trends in the new models and offer them an opportunity to express their views on modern car design.

Discussion will be led by Herbert Chase, whose "pertinent pokes" on car design have been heard at many S.A.E. gatherings. Merrill C. Horine, of Mack Trucks, will act as chairman and conduct the meeting, which will convene at 7:45, following the usual informal get-together dinner which precedes all Met. Section meetings. Both meeting and dinner will be held at the Roger Smith, 40 East 41st Street, New York.

Bear Enlarges Plant

Bear Manufacturing Company has begun construction of a two-story addition to its Rock Island plant. This increase of manufacturing facilities, the company says, is necessitated by the company's rapid business expansion and its prospective 1935 demand for Bear Wheel and Steering Alinement equipment which will include a number of new and improved shop tools.



Pierre Bertrand, French racing driver, skidded in the main event at the Los Angeles Legion Ascot Speedway recently and his car turned completely over. Bertrand sustained only minor bruises, examination at a hospital revealed.

New Steel Tops Boost Automotive Tonnage

Prompt Delivery Demands Cause Quick Step-up in Production Schedules

Responding to the importunate demands for prompt and in the aggregate heavy shipments of steel products that have come from motor car and truck manufacturers, tractor specialists, and parts makers, the steel industry lost little time following the Christmas holiday in stepping up its production schedules. While the American Iron and Steel Institute places the rate of current operations at 35.2 per cent of ingot capacity, that of finishing mills ranges all the way from 40 per cent to full capacity.

So much in the way of a backlog has accumulated from body builders that sheet mills are operating in some instances at the highest rate of the year. Steel tops are adding to the automotive industry's tonnage consumption of steel. Strip mills have also gone into higher production ground. What little in the way of flat steel reserves consumers had on hand has been worked up and all orders call for earliest possible shipment. A notable upswing in demand is noted in both ordinary merchant bars and cold finished bars. Buying of the latter usually trails behind that of flat steels, and it is thought that a good deal of bar business overhangs the market.

Automotive alloy steel makers share impressively in the business that is coming out. Refinements in springs through the use of new alloy steels made for that purpose add to alloy steel takings. A financial news bureau calls attention to the discrepancy between the leading interest's capacity, which is 40 per cent of the total, and its share of the total business, which in recent months has been around only 35 per cent. With the increased lead attained by automotive consumption in the 1934 record of the steel industry, there has been a notable shift in the relative importance of different steel products. Ambitious equipment programs to provide the necessary facilities to supply automotive demand have recently been announced by a number of steel producers, among these subsidiaries of the leading interest. So that competition for automotive business in 1935 is certain to be spirited.

Pig Iron—More active demand for pig iron is expected to develop from automotive foundries from now on. Prices remain unchanged.

Aluminum—Leading refiners of secondary aluminum have filed price advances, ranging from $\frac{1}{4}$ to $1\frac{1}{4}$ cents per pound, the cheaper grades of No. 12 alloy coming in for the sharpest advances. No sooner had the higher prices been filed, than scrap prices rose correspondingly. The undertone of the secondary market is strong. Virgin metal prices continue unchanged and steady.

Copper—Pending the scheduled meeting of the world's copper producers in New York in January, all sorts of rumors per-

You could hear the noise from the Diesel engines in the new streamlined trains a mile away, we are informed, if it were not for the "world's largest" intake silencer and air cleaner shown here. The silencer and air cleaner used by Chevrolet is shown for comparison. Both units are made by AC.



taining to foreign market control are being peddled around in the market. Domestic consumption is light, with the "Blue Eagle" price unchanged at 9 cents, delivered Connecticut.

Tin—Bernard M. Baruch's admonition to the House Foreign Affairs Committee that the United States stock tin on a large scale as a necessary war precaution caused considerable interest in the market, without affecting prices, the quotation of spot Straits remaining virtually unchanged at 50.85 cents at the week's opening.

U. S. Aviation Leads World, Bendix Says

Vincent Bendix, president of the Bendix Aviation Corporation, South Bend, who has been on a three months' tour of European airplane factories, has returned. While in Russia Mr. Bendix saw the Maxim Gorky, the world's largest land plane, which carries 98 passengers, and inspected a Moscow plant where 10,000 workers were turning out bombers and transport planes under the direction of a woman. He visited another plant with 900,000 square feet of space devoted to the manufacture of airplanes.

Mr. Bendix said he and his party were impressed by the thoroughness of Russian aviation progress, but that the United States still leads the world in aviation, and is ahead of the rest of the world in all phases of commercial or military flying. One reason for Russia's rapid progress, according to Mr. Bendix, is the employment of American engineers who are directing the work.

Among Bendix executives who made the trip with their president was Victor Klierath, chief of the engineering department at the South Bend plant and George Goffner, Mr. Bendix' secretary.

Propose 5 Amendments to Automobile Fabrics Code

A public hearing on five proposed amendments to the automobile fabrics chapter of the rubber code will be held Jan. 15 at Washington. Three of the amendments have been proposed by the code authority and two by NRA.

The code authority's amendments would add a paragraph to the present code forbidding a "contract or order for future delivery . . . with an automatic cancelation clause included"; provide a new section on sales terms which would permit a two per cent discount from the invoice price; net payment 40 days from date of shipment or date of invoice, whichever is earlier, "except that the maximum terms for goods billed and shipped to customers in the States of California, Oregon and Washington from points east of the Mississippi shall be net 70 days." Another code authority amendment would require members of the roofing and backing subdivision to enter into written agreements binding their jobbers and distributors to observe 10 of the chapter's 11 trade practice rules and the code's prohibition of sales below costs.

The NRA has proposed a substitute for the present prohibition of rebates and secret allowances. The new provision would forbid secret rebates, refunds, commercial credits and unearned discounts. The second NRA amendment would delete the provision forbidding a member of the industry to "coat or combine customer's auto-topping fabrics to be used in replacement trades."

Tentative Program of SAE Annual Meeting at Detroit, January 14

Monday, January 14

Crystal Room

10:00 A.M. Transportation and Maintenance

L. V. NEWTON, Chairman
Painting Motor Vehicles—P. R. CROLL, Pittsburgh Plate Glass Co., and L. E. DuBEY, Ditzler Color Co.
How to Buy a Truck—T. L. PREBLE, Tide Water Oil Co.

Reception Room

12:30 P.M. Transportation and Maintenance Luncheon

J. M. ORR, Chairman
Motor Vehicle Design from the Operators' Viewpoint—F. L. FAULKNER, Armour & Co.

Crystal Room

2:00 P.M. Truck, Bus and Railcar

A. K. BRUMBAUGH, Chairman
Engineering Uses of Rubber—CURT SAURER, Firestone Tire & Rubber Co.

Grand Ball Room

8:00 P.M. Student Session

O. E. KURT, Chairman
Demonstrative Lecture on Acoustics—H. R. BERLIN, Johns-Manville Corp.

Tuesday, January 15

Crystal Room

10:00 A.M. Aircraft-Engine

ROBERT INSLEY, Chairman
Aircraft and Aircraft-Engine Performance as Affected by Engine Oil—S. D. HERON, Ethyl Gasoline Corp.
Cold Weather Operation of Aircraft Engines—ALAN FERRIER, Canadian Air Service
Report of C.F.R. Aviation Gasoline Detonation Subcommittee

Crystal Room

2:00 P.M. Aircraft-Engine

OPIE CHENOWETH, Chairman
Report of S.A.E. Ignition Research Subcommittee
Fuel Injection as Applied to Aircraft Engines by United States Army Air Corps—J. F. CAMPBELL, United States Air Corps Altitude Laboratories

Crystal Room

8:00 P.M. Passenger-Car Bodies

J. VOTYPKA, Chairman
One Unit All-Steel Automobile Construction and Design as Applied to Rear-Engined Cars—JOHN TJAARDA, Briggs Manufacturing Co.

followed by

Business Session

President D. G. ROOS, in the chair
Nomination and Election of Members-at-Large of Annual Nominating Committee

Announcement of Election of Officers for 1935

Discussion of proposed Constitutional Amendments

Wednesday, January 16

Crystal Room

10:00 A.M. Passenger-Car Suspension Symposium

W. R. GRISWOLD, Chairman
The Properties of Tires as Affecting the Riding, Steering and Handling of Automotive Vehicles—R. D. EVANS, Goodyear Tire & Rubber Co.
Suspensions and Car Structure—M. OLLEY, Cadillac Motor Car Co.
Farewell to the Horseless Carriage—E. G. REID, Stanford University
Transverse Leaf, Independent Springtime—K. K. PROBST, Leaf Spring Institute

Reception Room

10:00 A.M. Diesel Engine

H. D. HILL, Chairman
Cylinder Events Studied in the Logarithmic Diagram—A. T. GREGORY, Wright Aeronautical Corp.
A Rational Basis for Comparing Diesel Performances—E. S. DENNISON, Westinghouse Electric & Manufacturing Co.

Crystal Room

2:00 P.M. Privately-Owned Airplane

E. P. WARNER, Chairman
Are We Giving the Average Private Operator the Airplane Most Suitable to His Needs?—F. S. SPRING, Hudson Motor Car Co.
Sales and Technical Problems of Private Commercial Airplanes—PETER ALTMAN, Consulting Engineer, Stinson Aircraft Corp.; Director, Aeronautics Department, University of Detroit.
Air Transportation Equipment for the Private Owner—J. H. GEISSE, Department of Commerce

Reception Room

2:00 P.M. Diesel Engine

F. M. YOUNG, Chairman
Progress Report of the Volunteer Committee on Compression Ignition Fuel Research—T. B. KENDEL, Shell Petroleum Corp.
Design and Development of Injection Apparatus for High-Speed Diesels—C. R. ALDEN, Ex-Cell-O Aircraft & Tool Corp.

Crystal Room

8:00 P.M. Aircraft Transportation

W. A. KENNEDY, Chairman
Operating Requirements for Transport Airplanes—W. LITTLEWOOD, American Airlines, Inc.
Designer's and Manufacturer's Viewpoint on Requirements for Aircraft Intended

for Airline Operation—J. H. KINDEBERGER and J. L. ATWOOD, General Aviation Manufacturing Corp.

Thursday, January 17

Crystal Room

10:00 A.M. Fuels and Lubricants

A. L. BEALL, Chairman
Conference on Oiliness of Crankcase Oils and Lubrication of Copper Lead Bearings

Crystal Room

2:00 P.M. Passenger-Car Brake Symposium

G. L. MCCAIN, Chairman
Hydraulic Brake Actuation—BURNS DICK, Wagner Electric Corp.
Brake Drum and Lining Development—CHRIS BOCKIUS, Raybestos-Manhattan, and J. HAROLD HUNT, Motor Wheel Corp.

Grand Ball Room

6:30 P.M. Dinner

Detroit Section Acting as Host to the National Society
Outstanding Speaker

Friday, January 18

Crystal Room

10:00 A.M. Passenger-Car Engine Symposium

F. F. KISHLINE, Chairman
Engine Flame Temperatures Vary with Knock and with Position in the Combustion Chamber—G. M. RASSWEILER and LLOYD WITHROW, General Motors Research Laboratories
Flame-Movement and Pressure-Development in Gasoline Engines—C. C. MINTER, Consulting Chemist

Crystal Room

2:00 P.M. Fuels and Lubricants

A. L. CLAYDEN, Chairman
C. F. R. Report on Uniontown Tests
Worm Gear Lubrication—C. H. SCHLESMAN, Socony-Vacuum Corp.

Crystal Room

8:00 P.M. Production Symposium

W. H. MCCOY, Chairman
General Topic: Recent Outstanding Developments in Production Machinery and Methods
What Is Surface Finish and How Can It Be Measured?—E. J. ABBOTT, University of Michigan
Surface Integrity and Dynamic Strength
A. V. DEFEST, Massachusetts Institute of Technology
Conjugate Camshaft Grinding Machine—HOWARD DUNBAR, The Norton Co.
Single Point Boring of Cylinders and Diamond Turning of Pistons—W. F. WISE, Ex-Cell-O Aircraft & Tool Corp.
Improving Machineability of Alloy Steels—W. E. SANDERS, Delco Products Corp.
Triple-Action-Drawing and Redrawing Presses—F. J. RODE, M. R. HATCH and E. V. CRANE, The Toledo Machine and Tool Co.
Modern Resistance Welding in the Automobile Industry—P. W. FASSLER, P. W. Fassler & Co.

New Stock and \$7,000,000 Bond Issue Feature Studebaker Reorganization Plan

SOUTH BEND, IND., Dec. 26—A tentative reorganization plan for the Studebaker Corporation has been filed in the United States District court, South Bend, Ind., by Harold Hirsch, of Atlanta, Ga., chairman of the reorganization committee. The first hearing on the proposed plan will be held in Fort Wayne, Dec. 27, where federal court will be in session for a time.

The plan sets up management of the proposed new company, to be incorporated under the laws of Delaware, and in addition sets up the board of the White Motor Corp., of which Studebaker owns more than 95 per cent of the stock. The plan defines the new financial structure to be erected and methods by which stocks in the old corporation may be converted.

Paul G. Hoffman and Harold S. Vance, receivers for the corporation under the receivership, and trustees pending the reorganization under the new Bankruptcy Act, will be officers of the new company if the plan is accepted by the creditors. Mr. Hoffman will be president in direct charge of sales, and Mr. Vance will be chairman of the board of directors in direct charge of production. A. G. Bean, the third trustee, will be chairman of the board of directors of the White company.

The new company shall be organized under the laws of Delaware, or any other state approved by the reorganization committee and the underwriters and shall be capitalized as follows: With authority to issue \$7,000,000 in debenture bonds (it is estimated that there will be \$6,867,698 of these issued), and with authority to issue 5,000,000 shares common stock of the new company (it is estimated there will be issued 2,138,299 shares).

The seven types of creditors may exchange their holdings as follows:

Holders of notes will receive for each \$1,000 29.75 shares of White stock and 45.08 shares new company common.

Holders of the bank debt will receive for each \$1,000 29.23 shares of White stock and 44.29 shares new company common.

Holders of merchandise and miscellaneous debts, for each \$1,000 shall receive 29.23 shares of White and 44.29 shares new common.

Holders of Rockne Corp. debts for each \$1,000 shall receive \$276.84 cash; \$553.67 principal amount of debentures; 7.75 shares White stock and 11.07 shares of new company stock.

Holders of Studebaker preferred stock, not subscribing to debentures, shall receive for each 100 shares, 125 shares new common.

Holders of preferred stock seeking to subscribe, shall receive for each 100 shares, plus \$1,500, 347 2/9 shares new common and \$1,500 in debenture bonds.

Holders of Studebaker common, if subscribing for debentures, for each 100 shares plus \$225, shall receive \$225 in debentures and 33 1/3 new common.

Debenture bonds will be 10-year bonds, drawing 6 per cent interest, dated Jan. 1, 1945. They will draw interest from the time of consummation of the plan until Jan. 1, 1938, at 3 per cent, payable out of the net earnings. From that time on interest shall be at 6 per cent, paid regardless of earnings.

Twenty per cent of earnings shall be set aside into a sinking fund for the redemption of the debentures.

The new common stock will have a par value of \$1.

The consolidated balance sheet, included in the order, shows at present, total current assets of \$13,730,698.97 and total current liabilities of \$3,016,434.

Underwriters for the new company will be Lehman Brothers; Field, Glore & Co.; Halden, Stone & Co.; and Goldman, Sachs & Co. They must agree to buy or cause to be purchased all debentures and stock not subscribed to.

In order to become effective the plan of reorganization must be accepted by creditors holding at least two-thirds of the present debt of the Studebaker corporation and equal proportion of Rockne creditors. A majority of present stockholders also must accept the plan before it is finally approved by Federal Judge Thomas W. Slick.

When and if the plan is consummated the White Motor Company will be operated by a board of directors consisting of Mr. Bean, who is now president; F. H. Chapin, R. M. Fisher, Mr. Hoffman, David L. Johnson, W. A. McAfee, E. J. Quintal, Mr. Vance, and W. King White.

Sloan, Edsel Ford Among Best Dressed Men in U.S.

The movies and the automobile industry have played a scoreless tie in the matter of "America's Ten Best Dressed Men," each having placed two candidates on the tailors' All-America, according to the Associated Press. Late dispatches do not reveal whether there will be an elimination contest.

The two automobile men on the list are Edsel Ford and Alfred P. Sloan, Jr. These two were selected for "their business suits that give the alert look esteemed by Americans," says the A. P. announcement. Their movie opponents are Douglas Fairbanks, Sr., and Warner Baxter. Others on the list of 10 are E. T. Stotesbury, Philadelphia banker; William G. Loew, New York broker; Conde Nast, publisher; Claude Boettcher, Denver banker; David A. Reed, former Senator from Pennsylvania, and Walter D. Teague, industrial engineer.

Court Sets Houde Hearing for Jan. 7; Welfare Group Asks to Join with Corp.

The Houde Engineering Corp.'s motion for an amended bill of complaint from the government, in the latter's suit to compel recognition of the A. F. of L. union as the sole collective bargaining agency, will be heard in the Federal District Court at Buffalo, Jan. 7. Originally the court had set Dec. 24 as the date for the hearing, but at that time the government granted Houde an extension of 10 days beyond the hearing date.

In its motion for the amended bill the Houde Corp. contends that the government's first document is "uncertain, vague and indefinite," and asks that the government make a "further and better" statement of its charges that the Recovery Act has been violated. The Houde motion was made two days before the time set for answer to the original bill of complaint. The motion covers three specific and important points, and seeks

further explanation of them from the government. They are (1) whether the American Federation of Labor union in the plant is the representative of "all" or "any" of the corporation's employees; (2) whether the bargaining agent is the organization as a whole or the committee selected at an election held last March; (3) whether the A. F. of L. represents those employees hired after the election; whether it represents those employees employed by the company at the time of the election but who did not vote, and whether it represents those employed then but who voted for the Houde Welfare and Athletic Association. (The latter is an organization of employees who competed in the election against the A. F. of L. union.)

Since this action was taken by the corporation a second petition has been made by Houde workers to intervene in the suit. The first was made last week when Joseph W. Dambach, president of the Houde Welfare and Athletic Association, sought permission to be made a party to the suit to protect his individual rights should the company fail to appear in the action. This second petition has been made by Charles D. Hortman, secretary of the association, on behalf of the members of the association, and was filed for the employees by Edward A. Hamilton, a Buffalo attorney. Mr. Dortman said that his organization seeks to bargain collectively only for its own members.

Pontiac Prices for 1935

	Std. Six	Deluxe Six	Eight
Coupe	\$615	\$675	\$730
Two-door sedan ..	665	715	775
Four-door sedan ..	715	765	830
Two-door touring sedan	695	745	805
Four-door touring sedan	745	795	860
Sport coupe	None	725	780
Cabriolet	None	775	840
Chassis	425	475	525

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

There were further gains in general business activity last week, and industrial activity and retail trade continued to improve. It is expected that trade will decline moderately during the holiday period, but that the upward trend will be resumed shortly thereafter. Steel operations increased to 34.6 per cent of capacity, marking the ninth consecutive gain.

Freight Loadings Gain

Railway freight loadings during the week ended Dec. 15 totaled 579,935 cars, which marks an increase of 28,924 cars above those during the preceding week, an increase of 20,516 cars above those a year ago and an increase of 64,166 cars above those two years ago.

Chain Store Sales Up 11%

Sales of 27 chain store companies and two mail order houses during November amounted to \$212,815,396, as compared with \$192,675,299 in the corresponding period last year. Sales of these same companies during the first 11 months of this year were 13.6 per cent above those in the corresponding period last year.

Life Underwriting 10% Higher

Sales of ordinary life insurance in the United States during November were moderately below those in No-

vember, 1933. However, sales during the first 11 months of this year were 10 per cent above those in the corresponding period last year.

Current Output Increases

Production of electricity by the electric light and power industry in the United States during the week ended Dec. 15 was 7.5 per cent above that in the corresponding period last year. The current production figure is the highest reported since the week ended Dec. 20, 1930.

Crude Oil Production

Average daily crude oil production for the week ended Dec. 15 amounted to 2,418,850 barrels, as compared with 2,386,850 barrels for the preceding week and 2,352,950 barrels for the corresponding period last year.

Fisher's Index

Professor Fisher's index of wholesale commodity prices for the week ended Dec. 22 stood at 78.4, as against 78.6 the week before and 78.7 two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended Dec. 19 showed no changes in holdings of discounted bills, government securities, and bills bought in the open market.

Workers' Union Withdraws From ALB Jurisdiction

Following the lead of A. F. of L. leaders in the Detroit area, automotive workers of Indiana and Illinois, through F. G. Woods of South Bend, one of 11 members of the national council of United Automotive Workers of America, have withdrawn from jurisdiction of the Automobile Labor Board, created last year by President Roosevelt.

In a letter to the President, Mr. Woods, in charge of the workers of the two states, announced the withdrawal and asked the creation of an impartial board to replace the present one, which he charges is unfair. In the meantime he requested that the National Labor Relations Board assume jurisdiction of automotive issues in the district until the new agency can be formed.

Mr. Woods said he had full consent of members of local unions of the national automotive organization in the two states

in taking the action. Mr. Woods is a member of Studebaker federal labor union, No. 18310, United Automotive Workers of America.

Newfield to Represent Gilmer on Pacific Coast

The L. H. Gilmer Co., Philadelphia, Pa., has appointed E. D. Newfield Co., San Francisco, Cal., as its distributor for the states of California, Arizona, Nevada, and parts of Texas. Warehouses are maintained at San Francisco and Los Angeles.

John T. Whitaker Joins Ross Gear and Tool Co.

John T. Whitaker, until recently connected with the engineering and sales division of the Chrysler Corporation has been made assistant to the general manager of the Ross Gear and Tool Company, Lafayette, Ind., manufacturers of Ross Cam and Lever Steering Gears. The appointment was announced by E. Gruenewald, vice-pres-

ident and general manager of the Ross Gear and Tool Company.

Mr. Whitaker has already taken up his new duties at Lafayette. He is a veteran pilot, as well as an engineer, and is a co-organizer of the aeronautical division of the S. A. E. Mr. Whitaker, previously, had been resident engineer, at Detroit, for the Tidewater Oil Co.

Graham Field Stocks Average 1 Per Dealer

Reflecting a healthy condition and preparedness for introduction of its new models, field stocks of Graham cars averaged less than one car to each dealer as of Dec. 15, according to the corporation. Stocks of cars at the factory had been entirely sold.

It was indicated that the Graham-Paige Motors Corporation shortly will make definite announcement of its new six in the lowest price range which will be the basis of an aggressive sales campaign during 1935.

OK Gasket Supplement

The National Industrial Recovery Board has approved a supplementary code for the gasket manufacturing industry, a product group of the automotive parts and equipment manufacturing industry. It will become effective December 30. The trade practice rules approved include the standard emergency price provisions, regulation of allowances for returned goods, maximum discounts, an open price association, customer classification, warehousing rules, as well as certain standard clauses.

James H. Myler

James H. Myler, director of traffic of Chrysler Corp., died last Wednesday. He was 58 years old. Mr. Myler's connection with the automotive industry dates back to 1918 when he was appointed traffic manager of the Maxwell Motor Car Co. He has been director of traffic for the Chrysler Corp. since its organization.

NRA Ends Wholesale Code Levy Exemptions

An NRA administrative order terminating a previous exemption, now permits the Wholesale Automotive Code Authority to assess those who wholesale automotive merchandise as an incidental line, except such wholesalers whose principal line makes them subject to assessment by some other wholesale code authority. The principal effect of the new order, it is believed, is to make wholesale sales of automotive merchandise by car and other manufacturers, and by car dealers and distributors, subject to assessment by the jobbers' code authority.

Canadian Sales Upturn Expected

Price Increase Probable Says Brown, GM General Manager; Pontiacs Ready

A domestic sales gain of 15 per cent and an export increase of 40 per cent in Canada during 1935 is anticipated by H. A. Brown, vice-president and general manager of General Motors of Canada, Ltd.

Customer research in the Dominion has proved that six-cylinder motors lead in popularity, and with this information every effort is being made to get volume production on the new Pontiac six. This will be the first car of the GM 1935 line to be displayed. However, Oldsmobile and the standard Chevrolet will be ready for release prior to Jan. 1, Mr. Brown said. While Master Chevrolets will not be ready for display before the latter part of next month, this model will be ready in time for the Toronto Automobile Show. No changes are anticipated on the Cadillac-La Salle line for the coming year, and it will probably be mid-summer before a new McLaughlin-Buick will be ready. A new La Salle may make its appearance about June 1, Mr. Brown stated.

Regarding prices, Mr. Brown said he was not in a position at this time to make a definite announcement. However, he indicated that increases are probable, though they may not be made until sometime later in the new year. Production costs have risen and he said he did not believe the company would be able to absorb all of this increase.

The levelling of the sales curve is a pressing problem in Canada, the GM general manager said; the curve reaching its peak in Canada about the same time as in the United States. Canada will follow the lead of the United States company in the matter of staggering new model introductions to meet part of the employment problem.

The Canadian organization is meeting this employment problem, Mr. Brown pointed out, by increasing the working hours of employees during rush seasons, rather than by adding to the payrolls at such times. Thus an attempt is made to give employees enough over-time work to let them average a fair year-around wage.

Mr. Brown said he was not worried by the recent tightening of the "Canadian content" regulations. However, he said he felt it unfair to force a plant producing several different cars to qualify for each individual make in competition with a plant producing only one vehicle.

Legally Fixed Work Hours Uneconomic; Report States

In pamphlet form the Department of Manufacture Committee of the Chamber of Commerce of the United States has issued the report of its survey of the shorter work week. P. W. Litchfield, Goodyear president, is the committee chairman. Summarizing the result of

its study the committee states it is convinced "that statutory limitations on hours of work are uneconomic and disadvantageous to employees and to the general consuming public. . . . Adjustments already made in hours and wages by means of NRA code provisions and by voluntary action of employers have caused divergent results on volume of production and employment."

Continuing the committee points out that hour and wage standards must be suited to the requirements of each enterprise to produce a maximum volume of business and employment. The committee recommends that whenever standards for hours of work are considered necessary for any industry they should be established by agreement among the preponderant number of the enterprises without the arbitrary process of legislation. Further, the committee recommends adjustment of wage scales above the minimum should remain the responsibility of individual enterprises free from governmental control.

Walls With Nickel Co.

Fred J. Walls has joined the development and research staff of The International Nickel Co., and will concentrate on the development of application of nickel cast irons, including the wear-resistant nickel-chromium cast iron "Ni-Hard," and the high strength cast iron "Ni-Tensyliron."

Used Car Inventory Rises 8.6% in Phila. Territory

Dealer used car inventories in the Philadelphia area were 8.6 per cent higher in units and 24.5 per cent larger in value on Dec. 1, than on the same date last year, according to a survey of 107 dealers just completed by the local code commissioner, H. E. Cardoze, Jr. The investment per unit was \$267 as compared with \$233 a year ago.

Budd Body Shipments

Carload shipments of automobile bodies and parts by the Edward G. Budd Manufacturing Company, this year will exceed those of last year by approximately 38 per cent, the company announced. The increase is due to the general revival in the automobile business and to a larger number of models with all-steel bodies.

NAFC Changes Name

To distinguish it from small loan companies the National Association of Finance Companies has voted to change its name to National Association of Sales Finance Companies. The reason for the change was explained by John R. Walker, executive vice-president of the association, when he made public the new name of the organization.

CALENDAR OF COMING EVENTS

SHOWS

New York Automobile Show.....	Jan. 5-12
Los Angeles Automobile Show.....	Jan. 5-13
St. Louis Automobile Show.....	Jan. 6-12
Cincinnati Automobile Show.....	Jan. 6-12
Washington Automotive Assoc., Automobile Show	Jan. 12-19, 1935
Toronto, Canada Automobile Show,	Jan. 12-19
Newark, N. J. Automobile Show.....	Jan. 12-19
Buffalo, N. Y. Automobile Show.....	Jan. 12-19
Cleveland Automobile Show.....	Jan. 12-19
Milwaukee Automobile Show.....	Jan. 12-19
Detroit Automobile Show.....	Jan. 12-19
Springfield, Ill., Automotive Show,	Jan. 13-20
Brooklyn, N. Y. Automobile Show.....	Jan. 14-19
Philadelphia Automobile Trade Assoc. —Automobile Show	Jan. 14-19
National Motor Boat Show, New York	Jan. 18-26
Toledo Automobile Show.....	Jan. 18-24
Columbus, Ohio Automobile Show	Jan. 19-24
San Francisco Automobile Show.....	Jan. 19-26
Boston Automobile Dealers Assoc. —Automobile Show	Jan. 19-26
Pittsburgh, Pa. Automobile Show,	Jan. 19-26
Hartford, Conn. Automobile Show.....	Jan. 19-26
Syracuse Automobile Show	Jan. 19-26
Nashville, Tenn., Automobile Show	Jan. 20-26
Baltimore—Automobile Show	Jan. 21-26
Rochester Automobile Show.....	Jan. 21-26
Chicago Automobile Show.....	Jan. 26-Feb. 2
Montreal, Que., Automobile Show	Jan. 26-Feb. 2
Springfield, Mass. Automobile Show,	Jan. 28-Feb. 2
Lancaster Automobile Show.....	Jan. 29-Feb. 2
Harrisburg Automobile Show.....	Jan. 30-Feb. 2
Omaha Automobile Show.....	Feb. 3-9

Kansas City, Mo. Automobile Show	Feb. 9-16
Denver, Colo. Automobile Show.....	Feb. 10-23
Peoria, Ill., Automobile Show.....	Feb. 13-17
Bethlehem, Pa., Automobile Show,	Feb. 13-23
Evansville, Ind. Automobile Show.....	Feb. 23-27
Minneapolis Automobile Show.....	Mar. 9-16
Mankato, Minn. Automobile Show	Mar. 16-23

MEETINGS

Automobile Trade Association Managers
Midwinter Meeting—New York...Jan. 8

ANNUAL MEETINGS

Society of Automotive Engineers—Annual Banquet—New York	Jan. 7
Motorcycle & Allied Trades Assoc., New York City	Jan. 9
Overseas Automotive Club Annual Show Luncheon, New York.....	Jan. 10
American Engineering Council, Washington, D. C.	Jan. 10-12
Society of Automotive Engineers—Annual Meeting—Detroit.....	Jan. 14-18
American Roadbuilders Assoc., Washington, D. C.	Jan. 22-25
Automotive Parts & Equipment Mfrs., Inc.—Chicago	Jan. 29

CONVENTIONS

National Automobile Dealers Assn., Detroit	Jan. 14-15
Lafayette, Ind. (Purdue University), Automotive Service Conference,	Mar. 21-22

The Horizons of B

The Condition of Recovery

IN the previous discussion we pointed out the futility of the government's efforts in attempting to increase the use of bank credit for business loans. Various spokesmen of the government, long before the present administration assumed office, had taken the bankers severely to task for their alleged refusal to make loans and their insistence upon liquidity. One of the most severe critics of the banks was Atlee Pomerene, former head of the R.F.C.

The banks retorted vigorously. They were trustees for depositors who had the right to demand payment of their deposits on short notice or no notice at all. Furthermore, social impulses in the interest of recovery which could not be reconciled with sound banking would result in failure to repay loans and losses, which in the first instance would fall upon the banks' stockholders and thereafter upon the banks' depositors, would fall, and in thousands of cases did so fall. The banks were constantly reminded of their previous generosity—by the government itself—this time through examiners of the Comptroller's office and the Federal Reserve banks.

A Plea for Consistency

To Uncle Sam the banks spoke in effect as follows: "You berate us in public for failing to make enough loans and for excessive caution. In private you place us on the grid for having made too many loans without adequate security. At the same time that some of your spokesmen indict us for lack of recovery enthusiasm, other representatives rake us over the coals for allegedly reckless grants of credit. Will you call a caucus of yourself and make up your mind what you want us to do? Then if you want us to scatter bank credit like so much fertilizer over the presently sterile field of business, please

tell us what to do if some of that credit fails to return."

Congress regarded this attitude as a bit of downright intransigence and decided to take matters into its own hands. It therefore placed \$580,000,000 at the disposal of the Federal Reserve banks and the R.F.C. to give meritorious applicants needed credit. After placidly waiting some months to permit the diffusion of this tonic, it took stock and made the painful discovery that all of Uncle Sam's credit and all of Uncle Sam's bankers had forced into use the grand total of \$4,000,000. This is approximately two-thirds of one per cent of the fund which had been made available. Apparently Uncle Sam is not able to do what he chided the bankers for failing to do.

It was then recalled that certain unorthodox suggestions had been made to the effect that the fault in this matter lay not with the bankers but with the borrowers. Perhaps there were no borrowers, that is to say, eligible borrowers who would be able to repay their loans. As indicated in the previous article, this is precisely what the investigators of Mr. Morgenthau found to be the case.

The Normal Recovery Process

This raises the next question. What constitutes an eligible borrower and why are eligible borrowers so scarce? An eligible borrower is one who believes he can convert funds into goods and services, sell these products at a price which will permit repayment of the funds and leave a margin for profit. Next he must be able to persuade the banker to share this conviction. The principal difficulty with would-be borrowers is that they lack confidence in their ability to produce and sell at a price which will cover costs. In all past depressions costs remained at rock

bottom levels until increased buying in the market had restored profit expectations and created a capacity to meet higher costs. In the present instance, costs were raised first on the theory that the general diffusion of these costs would create greater buying power in the market and thus restore to merchants and producers the means with which to meet these higher costs. The soundness of this reasoning is open to serious question.

Whatever answer we find, however, the fact remains that the initial risk of the borrower has been greatly increased through this inversion of normal recovery processes. The greatest present obstacle to business recovery is the forbidding relation of costs to the price which the market is willing to pay. The courage necessary to take the risks that attend the turn of the business tide must be buttressed by the reasonably certain prospect of profit. The high-cost theory of recovery must be blamed for the failure of an adequate number of eligible borrowers. This is the factor which above all else has frustrated the government's efforts to increase the use of bank credit, create additional jobs and raise prices.

Human Nature in Economics

It is necessary for all hands to return to the human factor in economics. Too many of the architects of artificially induced prosperity consider economics as a science in which objective forces alone prevail, forces which can be measured and controlled in the interest of whatever purpose the controller may have in mind, whether it be higher or lower commodity prices, higher or lower security values, revival of construction, employment, foreign trade, etc. They forget that economics is as much a study of human nature as it is a study of tangible phenomena, that the human factor will raise havoc with the most carefully

Business

by Joseph Stagg Lawrence

calculated material formulae. Nothing illustrates this better than the earnest and, in the light of previous policy, radical efforts of the government to raise prices. Uncle Sam has reduced the gold content of the dollar. He is accumulating a vast and—from the standpoint of sound money and credit—totally unnecessary hoard of silver. In so doing he is seriously disturbing the monetary system and economy of the Orient. He has broken his own solemn promise to pay his obligations in gold, and persecuted those who insisted upon exercising their normal proprietary rights regarding the yellow metal. He has loaned prodigious sums to farmers, bought stock in thousands of banks, insured deposits and increased the national debt to its greatest recorded total, all more or less for the purpose of raising prices.

He is baffled by a refractory human element which has nullified his efforts. The effect of this element is seen clearly in the failure of bank loans to expand. The government has given the banks a larger coat in the faith that this will result in the desired chest expansion. As long as business men are barred or think they are barred from realizing a profit, they will refuse to apply for loans and will, of course, make little headway with the banks if their optimism is poorly founded. This failure of loans to expand accounts for one of the two dimensions of credit and monetary supply. The failure, as we have pointed out here, is due entirely to a human factor no more substantial than the faith of business men and bankers in the future.

Money Turn Over

The supply of credit has a second dimension which is affected by the same force that retards the expansion of loans. If you have five dollars in your wallet, it cannot perform the service for which money is designed as

long as it remains in your pocket. Money as a medium of exchange enables you to dispose of our own products and get what you need in return. It is a device which eliminates what would otherwise be a highly complex system of barter. So long as it remains in your pocket it fails to function as an instrument of exchange. If you buy a pair of shoes with it and the shoe merchant pays it out in wages, and the wage earner spends it for groceries, etc., it performs five dollars' worth of money work every time it changes hands. If it changes hands twenty times in the course of the year, this five-dollar bill will have accounted for a hundred dollars' worth of money work. If it turns over only ten times, the total money work for the period will be fifty dollars. This turnover or velocity of circulation is the second dimension of our monetary supply.

If the country has an aggregate of \$40 billion in bank deposits and currency which normally turns over 20 times, our instruments of exchange will account for \$800 billion of transactions. A single unit of velocity accounts for \$40 billions of purchases. Thus, if the owners of funds could be persuaded to release them more quickly and reduce the time during which they are at rest, even a slight increase in velocity would produce an aggregate spending power beside which the efforts of the government to distribute buying power in the form of relief and public works must seem puny. With one dimension of our monetary and credit supply at \$40 billion, an acceleration of turnover from the present 15 times a year to 18 would release a volume of buying power exceeding four times the present national debt! This being the case, it would seem that government pol-

icy should address itself toward one object, the restoration of a measure of general confidence which will persuade business men to reduce their bank balances and consumers their fluid reserves.

Direction of Government Policy

It is for this reason, and this alone, that such measures as the restoration of the gold standard and the balancing of the budget assume the greatest importance. If money were an objective science such as physics, the elimination of the gold standard and the substitution of a managed standard might be a simple matter. Similarly, we know from history that nations have had budgetary deficits for periods far exceeding the current American experience—and survived. This is not the point. The matter which must receive attention is the effect which such measures have upon the human disposition of the 130 million guinea pigs who constitute the American people. If they induce men with funds to line their pockets with fish hooks and force consumers to place padlocks on their wallets, they will do only what is necessary to sustain life in modest comfort from one day to the next. They will eat and treat themselves to those satisfactions which constitute their standard of life. They will take no chances with the future. There will be no venturing in the domain of the doubtful. The instinct of speculation will remain dormant. This is precisely our experience today. Chain store sales and food distribution fails to reveal any depression. However, if we examine private construction and the capital goods industries in general, we become aware of a profound pause. The essential condition of recovery is the revival of normal American aleatory zest.

New Bodies and a Better Ride

IN appearance the Ford V-8 for 1935 is entirely new. The grill, hood and bodies, fenders, lamps, wheels, in fact the car from bumper to bumper has been newly designed. Special attention has been given to riding comfort and ease of control, including not only the spring suspension, weight distribution and passenger position, but braking, clutch action and steering as well. The V-8 engine has been improved in several details and a new system of crankcase ventilation has been added. Throughout the chassis effort has been made to refine the design to keep overall weight as low as possible, and to take full advantage of manufacturing facilities.

The term "center-poise" has been adopted to summarize three principal groups of design elements which have been combined to obtain improved riding comfort. The first group of changes relates to the spring suspension system. Transverse spring mounting is retained, but has been completely redesigned, including new front and rear springs, a new frame, radius rods and other allied parts. Both springs are longer, particularly the front, which is 7½ in. greater in length than that in the 1934 car. The front spring is also ¼ in. wider. The bow in the rear spring which was formerly required to clear the axle differential housing has been eliminated, and the spring is now straight. It is also ½ in. longer than formerly.

The deflection rates of both front and rear springs are materially lower. That

of the front is approximately 290 lb. per inch and that of the rear 190 lb. per inch. The longer front spring contributes to car stability when making turns.

The front spring is now placed 4 in. ahead of the axle, corresponding to the placement of the rear spring behind the

axle. The "springbase," or distance between the points of attachment of the front and rear springs to the frame has been increased from 117 to 123½ in., a gain of 6½ in., without altering the wheelbase, which remains at 112 in. Overall length, however, has been increased 8 in.

Ford Features

Front and rear spring deflection rates materially lower; spring base increased 6½ in. by mounting front spring forward of front axle.

* * *

Weight division between front and rear axles is now 50-50 as result of moving engine forward 8½ in. Seats moved forward accordingly.

* * *

Box section frame side members fore and aft of X-member.

* * *

Tire size increased to 6.00 x 16 in.

* * *

Orifice-type, double-acting shock absorbers.

* * *

Cross steering.

* * *

Reduction in pedal pressure effected by brake improvements.

* * *

Centrifugal force supplements spring pressure in new clutch.

* * *

Crankcase ventilation, cast camshafts and lead-bronze rod bearings among new engine features.



The de luxe three-window coupe of the 1935 Ford V-8 line

Feature Ford Line for 1935

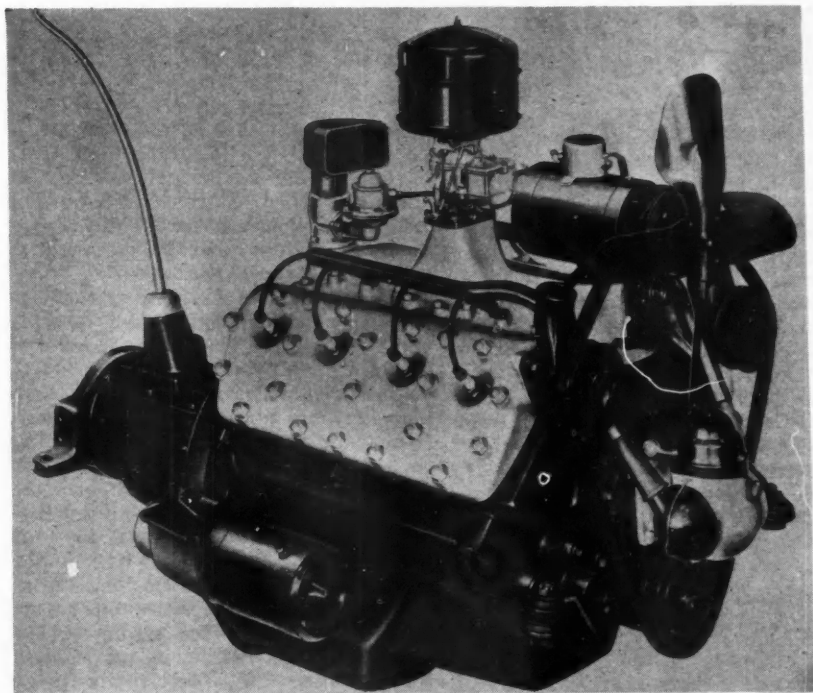
The method of attaching the spring tips to the axles is also new. The spring shackles are now attached to forged perches welded into ends of the radius rods, both front and rear, to which the axles are also attached. The radius rods are of larger rectangular section, tapering toward the center mountings on the X-member and torque tube.

The frame is entirely new, and attention has been directed toward in-

creasing its rigidity. The X-members which formerly were fitted closely within the side-rails and extended only to the front and rear cross-members, now extend their full length, but instead of fitting closely within the side-rails are arranged to form box-section members to the cross-members, to which the springs are attached. Two braces between the centers of the X-members and the side-rails also have been added, one of which forms the

rear support for the storage battery. Where the X-members are connected at the center of the frame a new deep box-member of welded construction is used, which has the top face recessed to permit the torque tube to pass over it. The front cross-member is much wider than formerly, providing a stronger mounting for the front spring. Triangular gussets which extend forward from the cross-member to the side-rails also support the bottom of the radiator. The full width of the frame is continued from the rear to a distance much farther forward than formerly, thus providing a secure support for the wider bodies used in the new car. The box design of the side-rails permits reducing their depth. The height of the frame from the ground between the axles is about 2 in. less than formerly, but adequate ground clearance has not been sacrificed due to the placement of as many chassis parts, such as the muffler, exhaust pipe, battery, etc., within, or close to the top and bottom flanges of the frame.

The second group of features contributing to improved riding comfort revolves around a completely new distribution of chassis and body weight. The engine has been moved 8½ in. forward of the conventional position until it is now partly over the front axle, resulting in an almost equal distribution of weight between the front and rear axles in the completed car. In no case, however, has the weight on the front wheels been permitted materially to exceed that on the rear wheels.



Ford V-8 engine for 1935. Note the scoop of the crankcase ventilation system, at the rear top. The engine now has a cast alloy iron camshaft and copper-lead floating connecting rod bearings

The new Ford de luxe Fordor sedan

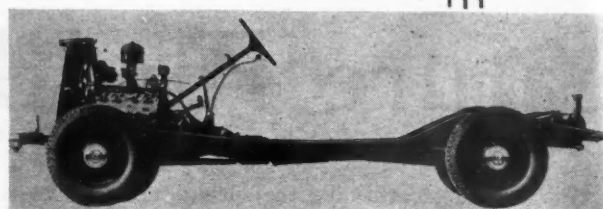


Coincident with moving the engine forward, the torque tube and driveshaft have been made correspondingly longer. The driveshaft has been increased in diameter from 1 3/4 in. to 2 1/2 in., and thickness of metal reduced from 3/32 to 1/16 in., and is now of the tapered end type. Tests are reported to show a 100 per cent increase in rigidity and a 25 per cent increase in tensile strength. The double taper roller bearings supporting the pinion shaft are spaced farther apart than formerly, and an additional roller has been added to the straddle-bearing to decrease wear by maintaining accurate pinion alignment. The axle tread has been increased from 56.68 in. to 58.25 in. to afford space for the larger tires, and permit wider rear seat cushion.

The change in passenger location relative to the longitudinal center of gravity of the car constitutes the third feature involved in obtaining greater riding comfort. Full advantage has been taken of the more forward position of the engine to move the front and rear seats ahead a corresponding amount. Both front and rear-seat passengers are thus placed closer to the center of the chassis, hence have less vertical motion relative to the ends of the chassis, the rear-seat passenger weight resting 8 1/2 in. forward of the former position. Emphasis is placed by the manufacturer upon the fact that no matter how many passengers are in the car, or where they are placed, the weight on the front wheels will never be appreciably greater than on the rears, so, it is stated, that in no case can front-end heaviness affect control of the car on slippery road surfaces.

The tire size has been increased to 6.00 x 16, with rim width of 4 in. Tires will use new tread designs and the "flatter" shape which lately have

Side view of the chassis, showing the new position of the engine, which has been moved forward 8 11/16 inches. The frame ends have greater kick up and the ends of the X-members form box sections with the ends of the side rails



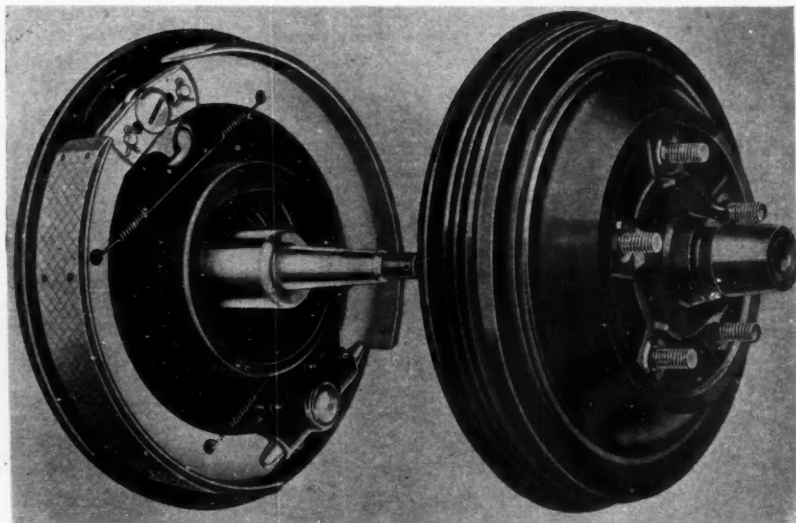
proved to increase traction and to reduce tire "roll" on turns. An inflation pressure of 30 lb. is recommended for normal operation. The double-acting hydraulic shock absorbers are now of the orifice type, wherein the principle of uniform flow through an aperture in a thin disk is utilized to prevent variable action due to changes in viscosity of the fluid resulting from changes in temperature.

Tests are said to show that the stability of the car on turns is greater than in the 1934 model and that it is possible to take turns at from 5 to 7 miles per hour faster in the new car with no more sway than was experienced formerly. In part, this is attributed to the greater length of the front spring with its tips supporting the chassis from points nearer the wheels. The more rigid front cross-member, the lower frame and the increased rear wheel tread also contribute to this result.

Cross-steering, wherein the drag link is substantially parallel with the front axle and runs to the right front steering arm in place of the left, is employed in the new car. Although

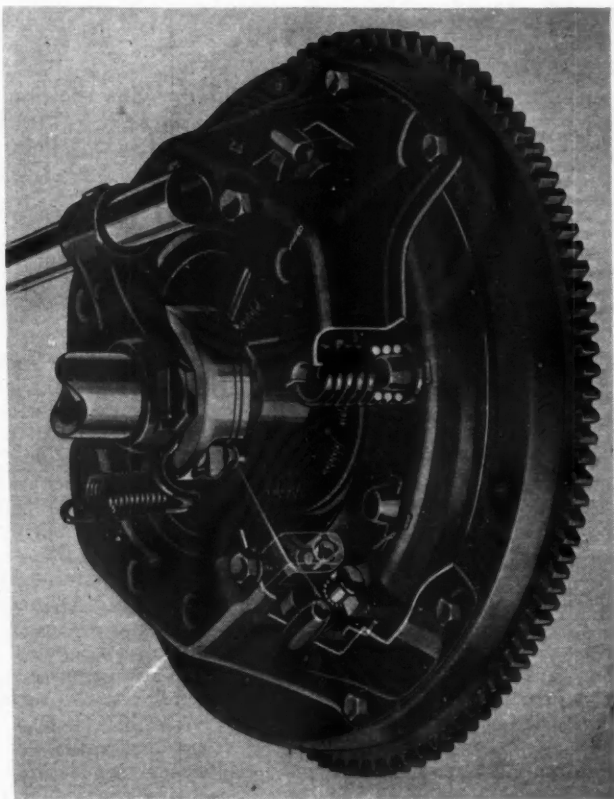
the steering column gear ratio of 15 to 1 remains unchanged, minor changes in knuckle arm and lever length, combined with larger spindle bearing areas (resulting from changes in the oil grooving of these bushings), obtain as easy steering as formerly, despite the increased weight on the front axle. The steering wheel is slimmer and is equipped with fingerholds closely spaced around its periphery. It is of the three-spoke solid metal core type with integral metal rim. The wheel is surfaced with a phenolic resin which will not soil the hands.

The mechanical braking system has been entirely redesigned and is especially effective. The brake shoes now are of the self-centering type and are shorter and wider to utilize the available braking surface more effectively. In place of short lever arms attaching the shoes to the backing plate pin, slotted pins are used within which the webs of the shoes fit. This design permits the shoes to slide vertically. A "floating wedge" or cam is used in the shoe-expanding mechanism, both front and rear, so that the shoes can center themselves within the drums. The braking area is 186 sq. in., as formerly, providing an exceptionally large braking surface for a car of this weight. The brake drums have an additional number of cooling ribs and are of alloy-iron. The shoe actuating shafts now are placed at right angles with the brake rods, so that a direct pull is exerted on the shaft levers. The brake cross-shaft is mounted on brackets attached to the X-members at a point located in front of the center box-member of the frame. The location of the shaft thus coincides closely with the centers about which both front and rear axles move, namely the ball joint of the front radius rods and the forward end of the torque tube. The linkage is thus practically free from the influence of axle motion, and is equally effective in either the forward or backward motion of the car. The distribution of braking force between front and rear wheels is normally 50-50. The entire design is such that a measurable reduction in pedal pressure is obtained.



The newly-designed internal expanding mechanical type brakes. They require less pedal pressure, and embrace a floating wedge as part of the design, to equalize pressure upon the shoes and in turn upon the drums. Additional drum ribs give a 40 per cent increase in cooling effect

The 1935 clutch requires less pedal pressure for operation and is much softer in action. The design utilizes three weights at the ends of the throw-out arms so placed that when the engine speed is increased they add pressure to the clutch plate, to compensate for the lower spring pressure. Cushioning springs are used between the hub and disc, which is of flexible steel spring "saucer" type. The clutch pressure plate is of copper alloy iron with ground surface



Ease of control is assisted further by the use of a new clutch in which centrifugal force supplements the normal spring pressure. At idling and gear-changing speeds (up to 750 r.p.m.) the pedal pressure is reduced approximately 15 per cent, increasing as the engine speed increases until at 4000 r.p.m. the pressure is somewhat greater than previously existed over the entire speed range. Needle bearings are used on the pressure plate mounting pins and the throw-out lever swivel pins have a roller action as additional means of obtaining smooth clutch operation. The pressure plate is now machine turned and polished. In balancing, metal is removed from the bosses to avoid changing its cross-section. The clutch disk is fitted with a mechanical damper of the spring and friction type to eliminate noise due to synchronization of vibrations in the drive system. Eight springs, which are prevented from becoming overstressed by four stop pins, cushion the load in either direction. The friction necessary to dampen out torsional vibration is obtained by eight friction washers, four on each side of the hub flange under an adjustable spring load. The disk itself is slotted radially to relieve rim tension and provide flexibility. The cover plate stamping is triangular with legs extending to their points of attachment on the flywheel. This arch construction is exceptionally rigid and also provides excellent ventilation for the pressure plate. The pressure springs are set on asbestos base insulator washers, where they rest on the pressure plate to prevent excessive "set" of the springs

under extreme heat conditions. The clutch throw-out bearing is designed to require no lubricant during the life of the car.

Improvements in the V-8 engine consist primarily of the addition of crankcase ventilation, and the use of high-lead bronze for the floating connecting-rod bearings, as has been the practice in 1934 Ford truck engines. A new camshaft of cast-alloy iron, the metal similar to that used for the push rods (valve tappets) will be used in all engines as soon as production facilities permit. The camshaft bearings, instead of operating against the iron of the cylinder block casting, now are of the pressed-in steel-backed babbitt-lined type.

The crankcase ventilating system is especially designed to remove water-vapor from the crankcase, thus preventing possible blocking of the lubricating system from water freezing in the oil in cold climates. Dilution is also reduced. Air enters the engine

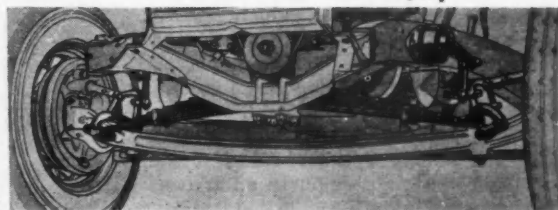
through a scoop replacing the oil filter cap. It is then conducted downward into the crankcase, whence it flows upward through openings into the valve chamber. Finally it passes downward out of the engine through a special cored passage in the cylinder block casting which mates with a port located in the right front corner of the crankcase pan. Gases are exhausted under the car.

Of particular technical interest is the fact that it has been possible by improvements in casting technique to decrease the thickness of the cylinder walls and other sections of the cylinder block and crankcase casting by amounts up to 1/16 in., thus reducing engine weight and improving the rate of heat transmission to the cooling water. The weight of the flywheel has been reduced. The total weight of the engine, clutch and transmission unit has been decreased approximately 20 lb.

To decrease fan and generator hum the crankshaft to fan shaft speed ratio has been reduced from 1.5 to 1.4 times engine speed. The bayonet-type crankcase oil indicator rod is now marked to indicate clearly the safe oil level operating range.

A total of some 120 minor design changes have been made in the new car, among which may be also mentioned a change in the heat treatment of the front axle to increase its strength, a 7-deg. front axle tilt instead of the 8 1/4-deg. formerly used, transmission gear teeth increased in width where possible without affecting allied parts.

Nine body types are listed, as follows: Phaeton, roadster, three-window coupe, five-window coupe, cabriolet, Tudor sedan, Fordor sedan, Tudor touring sedan and Fordor touring sedan. All of these are available with deluxe equipment. The roadster and cabriolet are fitted with rumble seats. The five-window coupe and Tudor and Fordor sedans are available also without the deluxe equipment. All bodies are materially wider, the increase at the front seat amounting to 5 1/2 in.



The front spring is longer, wider and softer, and is mounted 4 in. ahead of the axle on forged perches welded into the radius rods



Interior view showing wider seats and appointments. The Plymouth body is interlocked with the frame horizontally as well as vertically with 46 body bolts

NEW bodies of attractive appearance, soft, leaf-type front springs replacing last year's independent suspension by coil springs, a synchronized transmission, a new weight distribution, and higher power output are among the features of the 1935 Plymouth models, which are being introduced this week. All of the cars this year have the same wheelbase, 113 in., and the same chassis units. There will be only six body types—a business coupe, a two-door sedan, a deluxe rumble-seat coupe, a deluxe four-door sedan, a deluxe two-door touring sedan, and a deluxe four-door touring sedan, the last two having built-in trunks at the rear.

Riding qualities will be emphasized in merchandising the new models. The new suspension, of which illustrations were shown in previous issues of *Automotive Industries*, consists of semi-elliptic springs mounted on a tubular front axle. The springs, however, are quite soft and made of a new steel which is said to have superior mechanical properties. They are composed of a large number of relatively thin leaves, and the second leaf, which is split at the center, is wrapped around the spring eyes at both ends. There is a steel spacer between the main leaf and the third leaf at the center, so the second leaf is free to "breathe" as the spring flexes. All leaves are tapered at the ends, for a more nearly uniform stress distribution and the elimination of high-pressure points producing wear; they are also ground before heat treatment, to remove all surface imperfections on the tension side, thus reducing the chance of fatigue failure.

A ride stabilizer is provided at the front end and is similar in design and operation to that previously announced as fitted on Dodge cars.

Moving the engine forward 8 in. has permitted moving the body and major body load forward approximately 6 in. As a result of these changes there is

now 60 per cent of the total load on the rear axle and 40 per cent on the front.

While no changes have been made in the cylinder dimensions of the Plymouth engine, the latter is now rated at 82 hp., or the same as last year's special engine equipped with aluminum head at extra cost. That more power is obtained this year with the iron-head engine is due to the fact that a higher compression ratio is used—6.7 instead of 5.8. This very high compression

ratio for cast-iron heads is said to have been rendered practical by carrying the water jacket all the way down the cylinder and providing a vacuum spark control which reduces the spark advance under wide-open-throttle conditions. The distributor itself has a standard automatic spark advance operated by centrifugal weights and in addition a calibrated spring tending to retard the spark at all times against the operation of the centrifugal weights. As long as there is a high vacuum in the manifold the spring cannot retard the spark. But when the throttle is opened to a point where detonation might occur with the high compression ratio used, the drop in manifold vacuum, transmitted through a diaphragm, permits the spring to come into action, retarding the spark.

As previously mentioned, the water jackets have been extended farther down the cylinders, to improve the cooling, reduce the distortion of the bore, and lower the temperature of the lubricating oil. A tube is now inserted in the water jacket which throws a jet of water against the wall of the exhaust-valve pocket, to improve the cool-

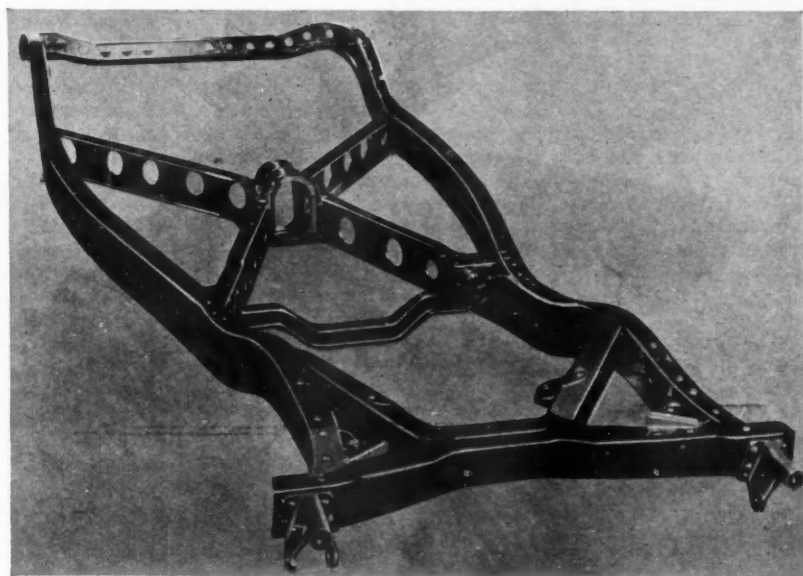
Plymouth Offers SixB

by Athel F. Denham
Detroit Editor, *Automotive Industries*



The 1935 Plymouth is streamlined from its massive radiator grille back over the sloping windshield to the tapering rear deck. It is 189 inches long from bumper to bumper, on a wheelbase of 113 inches

(Below) The frame of the 1935 Plymouth is the double-drop X-type



(Above) The two-door touring sedan. Plymouth bodies are three inches longer and three inches wider than last year's models. A capacious baggage compartment has been provided at the rear

ing of the exhaust valves. Valve-in-sets are retained.

Improved cooling is provided also for the generator, which now has a fan on its armature shaft, and for the clutch. In the clutch housing there is a screened air intake and there are outlets at the top of the housing, the rotating clutch itself acting as a cooling fan. As will be noted from the comparative specifications, the size of the clutch has been increased, while the pedal pressure required has been reduced approximately 30 per cent by changes in the linkage.

(Turn to page 807, please)

Body Types on 113-in. Chassis

Specifications covering features which have been changed this year

	1935	1934 Plymouth Deluxe		1935	1934 Plymouth Deluxe
Wheelbase	113 in.	114 in.	Propeller shaft diam.	2 1/2 in.	2 in.
Overall length, sedan	190 in.	185 3/4 in.	Clutch facings, O.D.	9 1/4	9 in.
Max. hp.	82 at 3600	77 hp. Std. head	inside diam.	5 5/8	5 3/4 in.
Std. compression ratio.	6.7 to one	5.8 to one (cast iron) 6.5 (aluminum. 82 hp.)	Transmission ratio, low	2.57 to one	2.81 to one
			reverse	3.48 to one	3.61 to one
Cylinder head material.	Cast iron	Cast iron	Freewheeling unit?	none	yes
optional head	none	aluminum	Rear axle ratio, sedans	4.125 to one	4.37 to one
Crankshaft vibr. damper.	no	yes	teeth in ring gear.	33	35
Manifold heat control.	Manual (seasonal)	Automatic	Front axle	Tubular	None
Piston rings, compression.	two	three	springing type	one-half elliptic	independent coil
oil	two	one	Front, length	37 1/4 in.
Valve length	4 27/32	4 25/32	width	13 3/4 in.
Tappet head material.	Chrome steel	chilled C. I.	number leaves, sedan.	10
Generator cooling	forced draft	none	Rear, number of leaves.	9	8
Starter ring gear.	steel ring	integral	Ride stabilizer	at front	none
Frame side rail depth.	5 in.	6 in.	Brakes, lining length per wheel	19 3/4	15 3/4
			area, total car	158.5 sq. in.	126.2 sq. in.
			Radiator core thickness.	2 1/4 in.	2 1/2 in.

Improved Springing, Hydraulic Brakes

FOR 1935 Nash offers three lines of cars, the 90-hp. Advanced Six of 120-in. wheelbase, the 102-hp. Advanced Eight with 125-in. wheelbase, and the Ambassador Eight with automatic overdrive, (called cruising gear by Nash) and other special features. All three lines are offered in two body types, a four-door, six-passenger sedan and a two-door victoria six-passenger sedan.

Major improvements made in the Nash lines range from advanced body styling to an improved system of spring suspension. Powerplants are said to be stepped up in power, wheelbases are 4 in. longer than last year, and the automatic overdrive or cruising gear raises the top speed, and reduces fuel and oil consumption and engine wear and tear. The springs have been redesigned to give a better ride; steering has been made easier, hydraulic brakes have been adopted, air wheels are standard on all models, and the seats have been moved forward for increased passenger comfort.

A good idea of the Aeroform body can be obtained from the photo showing a side view of one of the cars, which is reproduced herewith. There is considerably more slope to both the windshield and the back of the body,

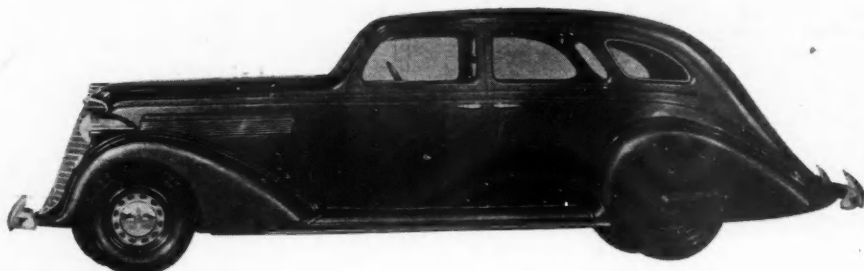
and major obstructions have been removed from the outside by providing space for the spare wheel inside the body at the rear, with the result, it is claimed, that 25 hp. less is required for overcoming air resistance at high speed. The windshield slopes back at an angle of 33 deg., while the back slopes at an angle of 35 deg. The spare tire, together with the tool kit, is carried under the rear deck in a compartment where there is additional room for baggage. The spare lies flat in this compartment and can be easily released by unscrewing a large wing nut.

The all-steel Aeroform bodies are all of the six-passenger type, each seat being sufficiently wide to comfortably accommodate three passengers. The

front seat is 4 ft. 8 in. wide. Special emphasis is placed on the safety feature of the all-steel body which comprises steel arches extending lengthwise and crosswise. Bodies are 4 in. lower than last year in overall height, and the center of gravity also has been lowered so that the overturning angle is in excess of 60 deg.

To improve the riding qualities, the engine was moved forward over the front axle, and the weight is now equally divided between front and rear wheels. At the same time the seats of the car were moved forward and the rear seat is now ahead of the rear axle instead of being over it.

Front springs have been lengthened from 37 to 44 in. and their "rates" in-

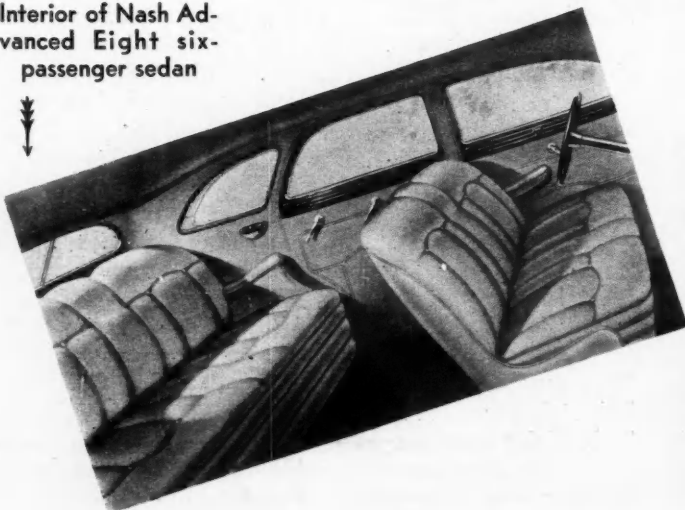


↑ Nash Advanced Eight six-passenger sedan for 1935

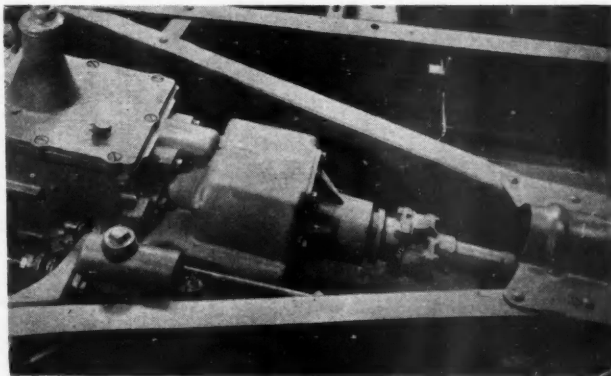


← Details of the steel body with steel floor

Interior of Nash Advanced Eight six-passenger sedan

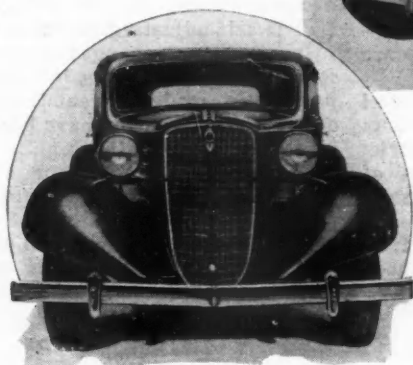
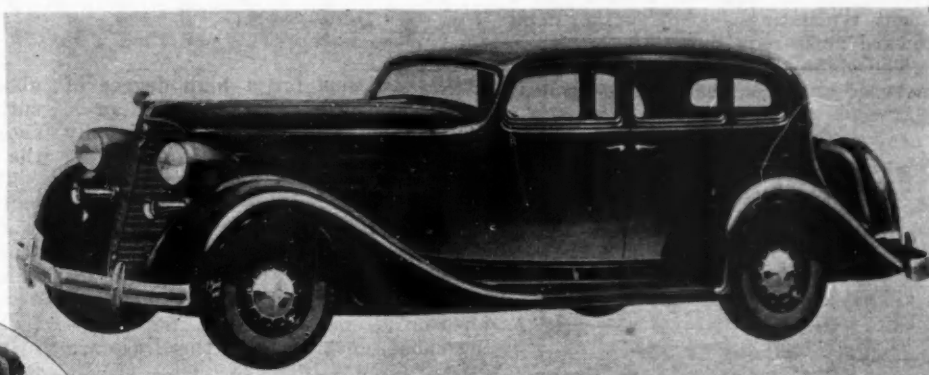


↓ Automatic cruising gear mounted back of transmission



Brakes Mark New Nash Line

LaFayette 1935 four-door sedan. Long horizontal louvers blend into the radiator assembly which is tipped back at a rakish angle



Front view of 1935 LaFayette



creased so as to make the frequency of the front end equal to that of the rear end. This tends to prevent pitching of the spring-suspended mass. In addition, the springs are provided with Silenite inserts between leaves, which maintain the friction between leaves uniform and prevent squeaking. Tests are said to have shown that these inserts have a greater life than the springs and that they make the spring action independent of weather conditions.

Another feature of Nash 1935 cars is the "cruising gear" which reduces the engine speed for a given car speed, thereby adding to the fuel and oil mileage and reducing engine wear. This device is automatic in action, the overdrive being engaged as the speed of the car reaches 40 m.p.h., and disengaged as the speed drops to 30 m.p.h. However, by means of a control button on the instrument board it can be locked out. Factory tests are said to have shown that at speeds of 40 m.p.h. and over the fuel mileage is increased by 5 per gallon, while the oil consumption is reduced 60 per cent. The overdrive has a ratio of 1 to 1.6, so that while in direct drive the engine does 3200 r.p.m. at 60 m.p.h., in overdrive it does only 2000 r.p.m. at that speed.

Greater roominess is claimed for the new bodies, both head room and leg room being increased over last year's designs. There are now arm rests for the front-seat passengers also; the gear-shift lever has been moved into a

the undivided type. Adjustment of the front seat has been simplified.

* * *

"SYNCHRONIZED springing" is the outstanding new feature of the 1935 LaFayette, Nash Motors' low-priced line. The term "synchronized springing" signifies that the rates of vibration of the car on the front and rear springs are substantially equal, which tends to eliminate unpleasant pitching motions. The water-cooling system is now sealed, which not only reduces the loss of water from the

Nash and LaFayette 1935 Prices

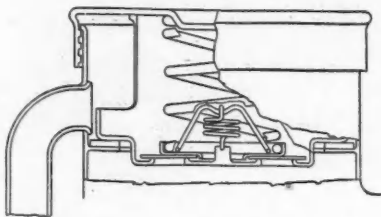
NASH			
ADVANCED SIX*			
	1935	1934	Change
3525 Victoria	\$895		
3520 Sedan	945	\$815	+\$130
ADVANCED EIGHT†			
3585 Victoria	1,115		
3580 Sedan	1,165	1,095	+70
AMBASSADOR			
3589 Victoria	1,240		
3588 Sedan	1,290	1,575	-285
LAFAYETTE			
STANDARD LINE			
3512 Coupe	585		
3516—2 door Sedan	620	595	+25
3515—2 door Sedan and Trunk	650		
3517—4 door, 4 window Sedan	670	645	+25
3518—4 door, 4 window Sedan and Trunk	700		
DE LUXE			
3510—4 door, 6 window Sedan	720	695	+25
3512R Coupe rumble	700	675	+25
3513—4 door, 6 window Sedan and Trunk	750	685	+65

*1935—120-in. wheelbase.
1934—116-in. wheelbase.

†1935—125-in. wheelbase.
1934—121-in. wheelbase.

system, and of non-freezing liquid in winter time, but increases the cooling capacity and makes possible sustained high speeds in mountainous country without suffering from over-heating, it is claimed. Emphasis is also placed on the noiseproofing of the car and its "feathertouch" control. To subdue body and chassis noises, insulating materials are used in no less than 71 distinct places, and an improved muffler and a silent ventilating system further tend toward noise reduction.

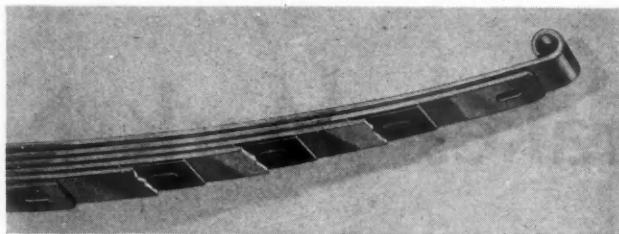
The claim of "feathertouch" control is based on such features as a worm-



Radiator cap with valves limiting pressure and vacuum in closed cooling system

and-roller steering gear, clutch-pedal starting, foot-control of headlights, and rotary control of the mechanical

Leaf spring with Silenite inserts



brakes. Claims for a high degree of safety are based on the use of an X dual frame and of an exceptionally wide rear tread—59 11/16 in.

All springs have non-lubricated inserts between leaves, which eliminate spring squeaks and—since they keep the interleaf friction constant—permit of accurate setting of the shock absorbers. Rubber spring covers are supplied on all special models. Self-aligning rubber-cushion converting links are used.

Spring leaves are separated by steel spacers at the center, which prevents rubbing at the inserts, so that the frictional or damping characteristics of the spring are entirely dependent on the frictional characteristics of the damper leaves. The coefficient of friction is quite high, and a marked shock

absorber action is produced within the spring itself; this permits of a softer shock-absorber setting, which prolongs the life of the shock absorber.

This development also has the advantage of making the riding qualities of the car less dependent on the passenger-load, since the total friction increases with the load and the shock-absorber action of the springs therefore is self-adjusting in character.

In addition to changes in mechanical features, improvements in body forms have been made. Streamlining characteristics of the hood have been accentuated with long horizontal louvers blending into the radiator assembly, which latter is tipped back at a very rakish angle. A new radiator ornament and bullet-shaped headlights help in further carrying out this effect.

Motor Vehicle Registrations

(As of Dec. 31, 1934 and 1933)

	Passenger Cars		Trucks and Buses		Total Motor Vehicles		Per Cent Change
	1934	1933	1934	1933	1934	1933	1934 over 1933
Alabama	191,172	175,483	34,104	30,852	225,276	206,335	+9.2
Arizona	80,100	74,729	18,490	14,767	98,590	89,496	+10.1
Arkansas	169,000	154,956	36,000	32,980	205,000	187,936	+9.0
California	1,906,863	1,772,273	115,924	220,077	2,022,787	1,992,350	+1.5
Colorado	244,349	239,058	25,374	27,433	269,723	266,491	+1.0
Connecticut	295,000	260,532	49,500	52,547	344,500	313,079	+10.1
Delaware	44,700	42,614	9,431	8,485	54,131	51,099	+5.9
Dist. of Col.	150,000	146,679	20,000	17,876	170,000	164,555	+3.3
Florida	270,000	232,861	55,000	46,404	325,000	279,265	+16.5
Georgia	320,236	275,823	61,648	49,276	381,884	325,099	+17.4
Idaho	85,600	81,282	14,400	13,739	100,000	95,021	+5.2
Illinois	1,281,971	1,276,864	178,800	186,186	1,460,771	1,463,050	-0.2
Indiana	720,000	652,802	130,000	114,704	850,000	767,506	+10.8
Iowa	590,000	561,395	75,000	68,466	665,000	629,861	+5.6
Kansas	450,000	445,583	75,500	72,404	525,500	517,987	+1.4
Kentucky	286,050	262,030	39,465	32,517	325,515	294,547	+10.3
Louisiana	199,820	191,993	49,143	44,393	248,963	236,386	+5.5
Maine	144,000	132,902	34,000	35,271	178,000	168,173	+6.0
Maryland	282,803	277,887	44,397	29,321	327,200	307,208	+6.4
Massachusetts	673,742	686,249	98,031	103,539	771,773	789,788	-2.2
Michigan	1,000,000	955,570	120,000	121,639	1,120,000	1,077,209	+4.1
Minnesota	592,250	579,908	104,156	99,335	696,406	679,243	+2.5
Mississippi	140,000	131,764	35,000	32,924	175,000	164,688	+6.4
Missouri	668,000	594,567	107,000	103,795	775,000	698,362	+11.1
Montana	98,826	82,765	31,388	27,480	130,214	110,245	+18.1
Nebraska	340,000	336,437	56,200	54,214	396,200	390,651	+1.7
Nevada	25,285	22,300	6,291	6,024	31,576	28,324	+11.5
New Hampshire	91,211	87,492	21,972	19,506	113,183	106,998	+5.8
New Jersey	730,000	697,707	140,000	128,887	870,000	826,594	+5.2
New Mexico	67,781	61,065	17,810	15,583	85,591	76,648	+11.6
New York	1,970,000	1,908,701	350,000	336,918	2,320,000	2,245,619	+3.3
North Carolina	350,000	332,648	50,000	49,660	400,000	382,308	+4.8
North Dakota	129,457	128,547	31,975	25,342	161,432	153,889	+5.0
Ohio	1,449,760	1,396,125	169,000	158,189	1,618,760	1,554,314	+4.0
Oklahoma	400,000	385,755	70,000	65,957	470,000	451,712	+4.1
Oregon	251,200	207,453	26,600	36,898	277,800	244,351	+13.7
Pennsylvania	1,466,397	1,409,708	229,902	225,311	1,696,299	1,635,019	+3.8
Rhode Island	123,755	117,793	19,520	18,463	143,275	136,261	+5.0
South Carolina	150,000	144,794	20,000	17,941	170,000	162,735	+4.6
South Dakota	145,000	146,408	23,225	22,841	168,225	169,249	-0.6
Tennessee	304,800	278,333	37,500	33,848	342,300	312,181	+9.7
Texas	1,048,666	1,013,086	223,572	188,676	1,272,238	1,201,762	+6.0
Utah	88,000	84,014	17,000	16,348	105,000	100,362	+5.0
Vermont	69,066	65,531	8,495	8,045	77,561	73,576	+5.4
Virginia	302,000	288,048	46,450	56,656	348,450	344,704	+1.2
Washington	360,055	362,370	68,887	63,165	428,942	425,535	+1.0
West Virginia	204,078	193,454	33,685	34,386	237,763	227,840	+4.8
Wisconsin	581,200	555,546	124,979	112,523	706,179	668,069	+5.9
Wyoming	52,000	45,609	13,000	10,643	65,000	56,252	+15.5
Total	21,584,193	20,557,493	3,367,814	3,292,439	24,952,007	23,849,932	+4.6

JUST AMONG OURSELVES

Group Insurance Hit at Hearing

IF the criticisms directed at group insurance at the hearing on automotive employment held recently in Detroit by NRA typify the workers' attitude on this form of protection, and are not just the complaints of a few malcontents, a great deal of misunderstanding exists which should be cleared up.

Certainly the industry has only the welfare of its workers in mind when it provides this insurance. But if the worker doesn't think group coverage benefits him, or if he thinks that the terms of the policy or the factors determining premiums work an injustice on him, the industry's good intentions are more or less wasted.

Recognizing that the hearing testimony on the subject was far from conclusive, the views expressed there did suggest to us, however, that greater efforts to create a better understanding of group insurance might well pay for themselves in improved labor relations.

* * *

Regularized Employment

POSSIBILITIES for regularizing automotive employment suggested in the report the NACC made to NRA more than a year ago included the concentration of new model announcements in the late summer or early fall, production of component parts and finished cars in the dull seasons, and the transfer of employees from one department to another to avoid lay-offs. Certain manufacturers are experimenting with the two latter possibilities and have gone

far enough to believe that as a result their 1935 employment curve will be smoother than it has been for quite a few years.

* * *

Among the proposals that have been made for stabilizing employment is that prices be adjusted seasonally to stimulate demand in dull periods. There are plenty of difficulties with this scheme, but one that hasn't been mentioned is that in California and some other states where temperatures don't go very low the sales curve is practically flat. In such states obviously there is no need to vary prices seasonally, yet if it were done in one state, it would have to be done in all.

* * *

Makers Cooperate On New Car Design

IT has not been uncommon in the past for two non-related automotive plants to cooperate with each other in reducing production costs. One company, for instance, might permit another to purchase stampings, etc., from body dies primarily developed for the first company.

Such cooperation, however, has largely taken place between factories which were non-competitive, strictly speaking, in price class.

It is an interesting development therefore to find today a growing inclination on the part of independent car producers to cooperate along the lines of engineering design. Particularly is this important when one holds to the theory that the primary requisite for successful operation of an "independent" or smaller car company is to offer something that is different.

Development costs of "different" automobiles is necessarily high. When two companies cooperate on design of similar general types of "different" cars, the development cost is cut almost in half, and production costs subsequently should be lower since engineering cooperation inevitably would result in the interchangeability of certain parts or units between the cars of the two companies, increasing total volume on such parts and reducing tooling cost charge per piece produced. There is no reason, furthermore, why such engineering cooperation should detract materially from the distinctiveness of the two "different" cars.

* * *

Packing Dealers Doesn't Up Sales

FROM what we gather here and there, country and small-town dealers have a much better 1934 profit showing than those in the larger, multiple-dealer cities. As a result, present indications are that in 1935 more discretion will be used in setting up new dealers in the bigger cities than has been the case in some instances in the past. One important factory sales executive summed the situation up succinctly recently when he said "Packing dealers in doesn't raise sales; it merely weakens dealers who are already there."

After all, how much overhead the reasonable sales potential of a territory can support determines the extent of the dealer organization a manufacturer can have in that area. Disregard of this principle in the big cities has been a prolific cause of dealer mortality.

* * *

LOOKING back to the days when Chevrolet was his only concern, GM vice-president W. S. Knudsen drew a round of chuckles at a Chevrolet dealer dinner recently when he said that now he has to look after so large a family that sometimes he feels like the old woman who lived in a shoe.—The Editors



Six Chassis Models in

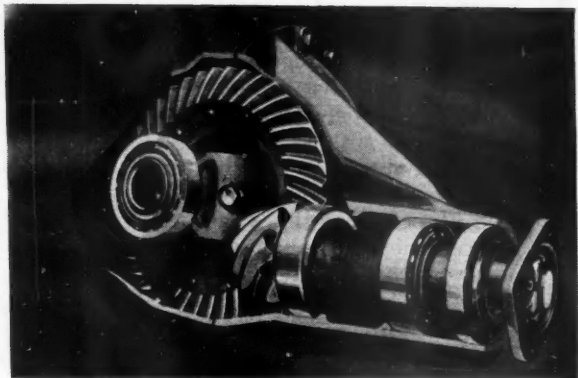
by Athel F. Denham

Detroit Editor,
Automotive Industries

SIX chassis models comprise the line of cars offered for 1935 by the Chrysler Sales Corp., as the result of the addition of a conventional Eight as distinguished from the Air Flows. All models of the Air Flow cars are continued unchanged in principle, but their front-end appearance has been modified to make it slightly more conventional.

In addition to the Air Flows there are now an Airstream Six and an Airstream Eight. These models carry entirely new bodies, continue the independent front-wheel springing used last year on the Chrysler Six, and have the engines moved approximately 6 in. ahead for better weight distribution and improved ride. On these cars the rate of the front springs is the same as that of the rear springs.

Partial top view Chrysler Air Flow Eight showing the new front end treatment.



Details of the Airstream Eight hypoid axle

With seats farther ahead, bodies on the Airstream models have sloping rear panels with built-in compartments

concealing the spare tire and having additional space for luggage. Windshields are more sloping, radiator grilles—which are farther ahead—have a slightly convex shape, and fenders and sheet metal parts generally are of new design. Transverse fender splash aprons in front have chrome decorative molding groups.

The major change in the Air Flow bodies consists in the provision of a new hood center panel which, as formerly, carries the radiator grille. The latter is V-shaped and sloping from top to bottom, rather than rounded, projecting somewhat farther ahead and in general materially improving the appearance of these cars.

Taking the cars individually, the Airstream Six has a 118-in. wheelbase, as compared with the 117- and 121-in. wheelbases of last year's Chrysler Six. Powerplants remain fundamentally un-



Three-quarter front end detail of the Chrysler Airstream Six, which supersedes last year's Chrysler Six

Chrysler 1935 Line

Airstream models, including new eight, have independent front suspension—Air Flow models continued with modified frontal appearance

changed. The compression ratio has been increased to 6.0, but the horsepower rating remains the same. Breathing capacity has been improved by enlarging the valve ports slightly. There are now two oil rings, 5/32 in. wide, as against one 3/16-in. ring last year, and only two compression rings are now used.

Starter engagement is by mechanical positive shift instead of by the solenoid control previously used. Mufflers are of larger diameter and longer.

Clutches are now provided with ventilating openings to improve their cooling. Free-wheeling has been dropped, and synchronizers have been added in the transmission for first and second speeds. Rear-axle gears have a smaller number of larger teeth and are now made of chrome-nickel steel. The final-drive ratio is 4.13 for sedans and 3.89 for coupes.

Brakes now have 10-in. drums. Rear springs are slightly longer than last year and have a greater number of thinner leaves, taper rolled to reduce friction. The over-all length of the car has been increased approximately 2 in.

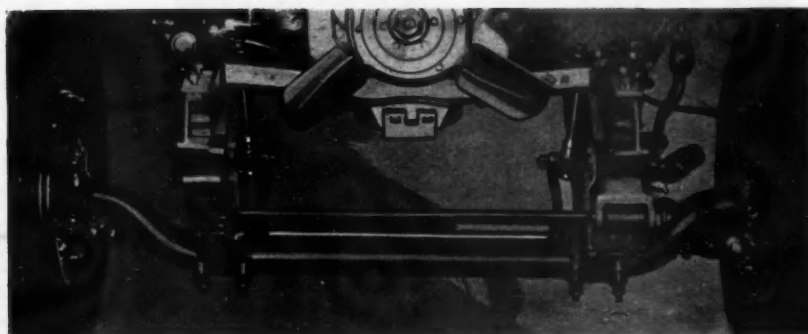
by moving the engine and radiator forward.

The automatic choke has been dropped.

The new Airstream Eight comes on a 121-in. wheelbase and has an engine developing 105 hp. at 3400 r.p.m. (compared with 93 hp. for the Six). It has a hypoid-drive rear axle with a final-

drive ratio of 3.95. Other points of difference between the eight- and the six-cylinder chassis are that the former has larger brake drums, of the same size (11-in.) as used on the Chrysler Six last year, a wider tread at the front, increased radiator capacity, slightly heavier frame side rail stock, a larger steering wheel, and larger (6.50-in.) tires on wider rims.

The engine has a bore and stroke of 3 1/4 by 4 1/4 in. with a piston displacement of 274 cu. in. The compression ratio is 6.2 and a cast-iron cylinder head is used. Other of the new engine features include floating-power mounting, a downdraft carburetor with automatic choke, connecting rods of high-manganese steel with replaceable liners, a counterweighted crankshaft with neutralizer mounted in steel-backed bearings, automatic heat control, alumi-



Mechanical details on the Chrysler Air Flow showing front end suspension with sway eliminator mounted at the front of the chassis

Fig.

num pistons with floating pins, and valve-seat inserts.

Compared with the 1934 Air Flow Royal Eight, the new Air Flow Eight does not show any major mechanical changes, although a number of points of difference may be noted. Aluminum heads have been dropped in favor of

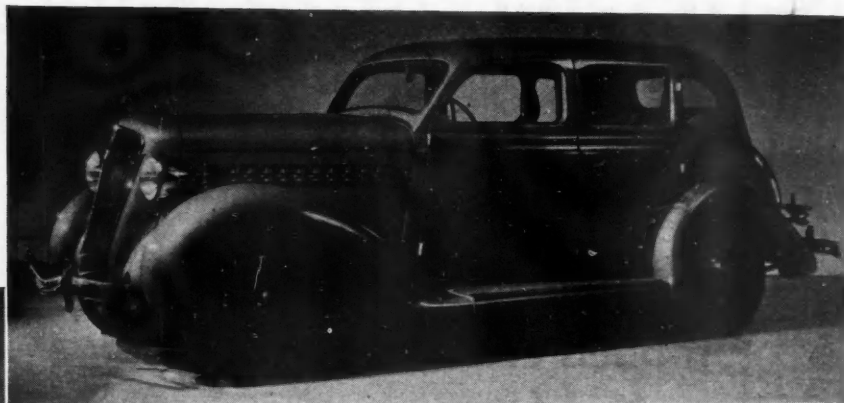
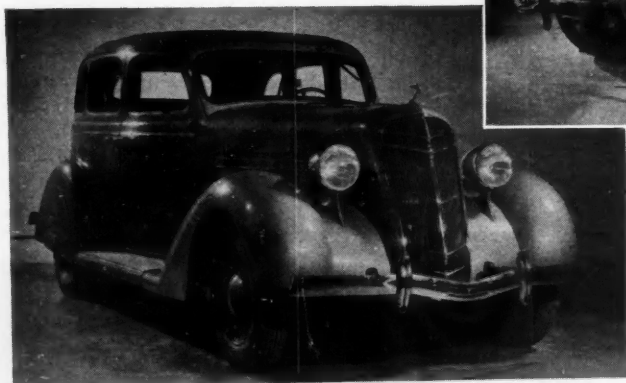
(Turn to page 806, please)



Side views of the Chrysler Imperial Eight Air Flow, and Airstream Eight

Airstream Six with Independent Front Suspension

Two views of the new Airstream sedan



Clutch ventilation is one of the new DeSoto features



Specifications

Wheelbase	116 in.
Engine	L-head, 3 $\frac{1}{2}$ x 4 $\frac{1}{2}$ in. six, 241.5 cu. in., developing 91 hp. at 3,400 with 6.0 compression ratio.
Crankshaft	Counterweighted, four main bearings 2 $\frac{1}{4}$ in. in diam. and of the following lengths from front to rear: 1 $\frac{1}{2}$, 1 $\frac{1}{4}$, 1 $\frac{1}{4}$, 2 $\frac{1}{2}$ in., fitted with torsional dampener.
Connecting rods...	Center to center length, 8 $\frac{3}{4}$ in., removable steel-backed bearing 2 $\frac{1}{4}$ x 1 $\frac{1}{4}$. Bearing for floating piston pin, 55/64 in. diam.
Pistons	Aluminum with two $\frac{1}{4}$ in. compression and two 5/32 in. oil rings.
Valves	Lift, 11/32 in., seat angle, 45 deg., intakes of chrome-nickel steel with 1 17/32 in. head diam. and exhaust of silchrome with 1 15/32 in. head diam. Exhaust valve seat inserts.
Camshaft	Cast alloy carried in four steel-backed bearings and driven by chain.
Carburetor	1 $\frac{1}{2}$ in. B. & B. supplied by camshaft pump.
Electrical units	Auto-Lite, 14 mm. spark plugs.
Lubrication	Chassis, Zerk. Engine, pressure to main, crankpin and camshaft bearings.
Clutch	Single plate with oil-less bronze pilot and ball thrust release bearings. O. D. of plate, 9 $\frac{1}{2}$ in.
Transmission	Helical gears, second speed 1.55, low 2.57, and reverse 3.48. Anti-friction bearings throughout except on reverse idle.
Driveshaft	Tubular 2 $\frac{3}{4}$ in. diam. with roller bearing universals.
Rear axle	Semi-floating with 3.89 ratio, tapered roller bearings.
Brakes	Hydraulics operating on 10 in. Centrifuge drums. Parking brake on driveshaft.
Shock absorbers ..	Double-acting front and single acting rear.
Springs	Front, coil; rear, semi-elliptics 53 $\frac{3}{4}$ x 1 $\frac{1}{4}$ with 10 leaves (sedan). Silent-U shackles with rubber bushing at front end of rear spring.
Steering	Worm and roller with 18.2 ratio.
Wheels and tires...	6.25 x 16 (28 lb.) on 16 x 4.25 steel spoke wheels.

FEATURING offerings of the De Soto Motor Corporation for 1935 is a more conventional six-cylinder model called the Airstream Six. In addition there have been refinements and improvements on the Airflow model which, however, is to all practical purposes continued fundamentally unchanged over the previous model. Primary changes in the Airflow consist of the adoption of a hypoid rear axle, larger capacity parking brake springs with thinner leaves and more of them, longer rear springs, ride stabilizer at the front end, wider rear tread, vacuum controlled spark advance, larger diameter propeller shafts, increased steering gear ratio for reduced sensitivity, synchronizers in the transmissions, elimination of freewheeling unit, and over-drive once more optional at extra cost.

t Suspension Added by DeSoto for 1935

The Airstream line on a wheelbase of 116 in. comes in six body models and puts DeSoto back in its original price field. The car is similar in general conception to the Chrysler Airstream Six and carries the same mechanical and body features as the latter model. Differences are largely in interior and sheet metal trim, including variations in radiator, grilles, hood louvers, etc.

Features of the Airstream DeSoto include, of course, all-steel bodies, hydraulic brakes and floating power as on all Chrysler models, and in addition independent springing, high compression cast-iron cylinder head for a power output of 93 at 3400 r.p.m. Bore and stroke of 3 $\frac{1}{8}$ x 4 $\frac{1}{2}$ in. is the same as for the Chrysler Airstream Six, as are other dimensions. With the bodies of the Airstream extending over the frame side-rails, running boards are but a short distance below the door opening.

Airflow models of the DeSoto line, it will be noted from the illustrations, have a new front end treatment with the radiator grille sloping more than rounded and slightly Vee-shaped, increasing the hood length and improving the general appearance of the car. The hard finish material used for last year's Airflow models has been superseded by a more conventional soft interior trim.

Mechanically in the Airflow the highlight is probably the adoption of hypoid rear axles for quieter operation. Rear tread has been widened to 58 in., at the same time, which in combination with longer and softer rear springs and continuation of the ride stabilizer adopted during the 1934 season, is

said to materially improve handling characteristics of this car. A further contribution in this direction is said to be the increase in steering ratio specified for 1935.

Parking brakes have been increased in diameter for longer life and more efficient operation. The new front end treatment has permitted the use of a single radiator core instead of the two separate units formerly required by the curved front end. Aluminum pistons are now placed in an electrolytic bath to produce a coating of hard aluminum oxide on the outside and increase piston life by reducing wear. Valve port diameters have been slightly increased for better breathing but horsepower is said to be unchanged. Adoption of a vacuum control modifying the spark advance for wide-open throttle conditions has been previously noted. Starter ring gears in the flywheel are now shrunk on and of steel. Mufflers have been increased in length for better silencing. Propeller shafts have been increased in diameter to reduce tendency to whip.

Two horns are now standard, while headlighting is of the two-beam type

controlled by a foot switch rather than the three-beam variety used on the 1934 models. The over-drive on the 1935 Airflow models, when specified, is of the type which cuts in at 35 to 40 mph., a slightly lower speed than formerly. A freewheeling unit is provided when the over-drive is specified, since the former unit is essential to the operation of the latter.

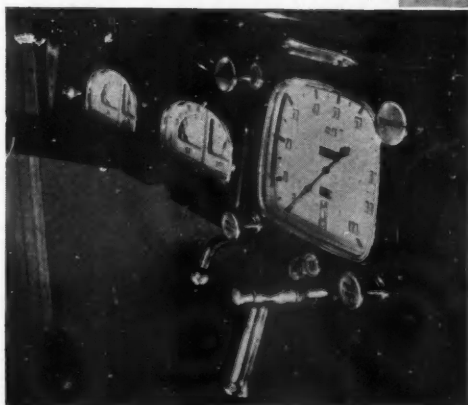
In the steering gear further improvements include the adoption of a large radial load and thrust ball bearing supporting the roller in the gear, replacing the needle bearing formerly used. A roller bearing, on the other hand, supports the cross-shaft, formerly mounted in a bushing. Steering geometry has been changed to improve handling also, with an increase in king-pin angle from 3 to 4 $\frac{1}{2}$ deg. Position of the steering wheel and the angle of the steering column have been changed somewhat to provide a more comfortable position for the driver. Airflow clutches are now air-cooled by the provision of ventilating openings, the efficiency of the clutch plate as a fan having been increased by ribbing it.



Side view of the 1935 Airflow showing the new hood lines



Interior of Airstream sedan and, left, the instrument panel



Six Chassis Models in 1935 Chrysler Line

(Continued from page 803)

cast-iron ones, and although the compression ratio remains 6.2, the horsepower rating has been reduced from 120 to 115 at 3400 r.p.m. The reduction in output is due no doubt, at least in part, to the use of a single downdraft carburetor in place of the former dual type. Connecting rods in this engine now are also of high-manganese steel, and two oil rings are used, in place of the former single oil-control ring.

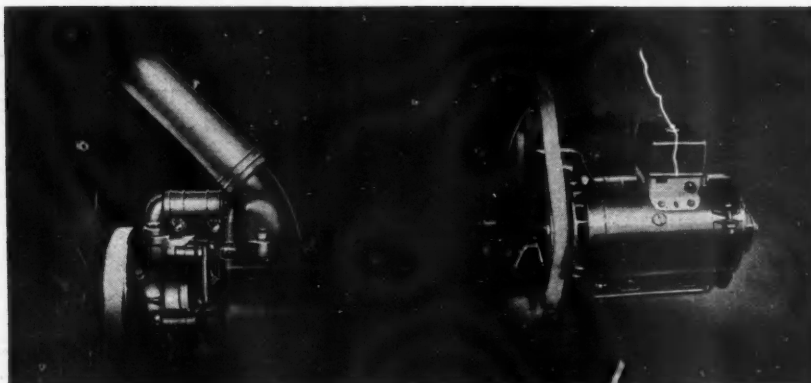
In the electrical units, which are of Auto-Lite manufacture, the same as those of other Chrysler models, vacuum spark control has been added, the generator has been provided with forced cooling, and the starter engagement is now of the positive-shift type, actuated by a solenoid switch. The vacuum pump formerly integral with the fuel pump has been dropped.

The size of the clutch has been increased materially, the outside diameter of the facing now being 11 in., and the housing is ventilated. Vacuum-operated clutches are no longer standard equipment, and the overdrive unit, which was added during the 1934 season, is now furnished at extra cost only.

In the braking system, the transmission brake has been increased in diameter to 7 in. and now has a cast-iron drum, which improves the braking action and increases the life of its lining. The vacuum brake booster is no longer standard equipment. Chrysler has returned to woven brake lining.

Further detail changes include the adoption of a steel-backed babbitt bushing for the steering-knuckle pivot, of larger diameter than the bushing previously used; of an oilite bearing in the water pump, a fin-and-tube type radiator core instead of the cellular type formerly used, and of thinner leaves and more of them for front and rear springs. Front springs, incidentally, are somewhat narrower than formerly, while rear springs have been increased in length. The tire size is now 7.00 in. on 16-in. wheels. When the overdrive unit is specified, a special axle with a ratio of 4.3 is used, this ratio together with the overdrive giving an overall ratio of 3.04.

All of the improvements discussed in connection with the Chrysler Air Flow Eight are also found on the Imperial Eight, which is continued on a 128-in. wheelbase. The engine of this car is distinguished from that in the Air Flow Eight by the use of new aluminum alloy heads which, with a standard compression ratio of 6.5, increases the output to 130 hp. at 3400 r.p.m. An optional higher compression head with a ratio of 7.5 raises the output still further, to 138 hp. at the same speed, as compared with 120 hp. for last year's Imperial Air Flow. On the Im-



The forced cooled generator (right) and thermostat by-pass

perial model, also, the dual downdraft carburetor, 7.50-in. tires, and the overdrive unit with freewheeling mechanism are retained. Further mechanical changes applying to this model include an increase in the diameter of the propeller shaft.

During the 1934 season sway eliminators were added on the various Chrysler Air Flow models, and these are retained for 1935. Body improvements include easier adjustment for the vane-type ventilators and an in-

crease in the number of body bolts to 46.

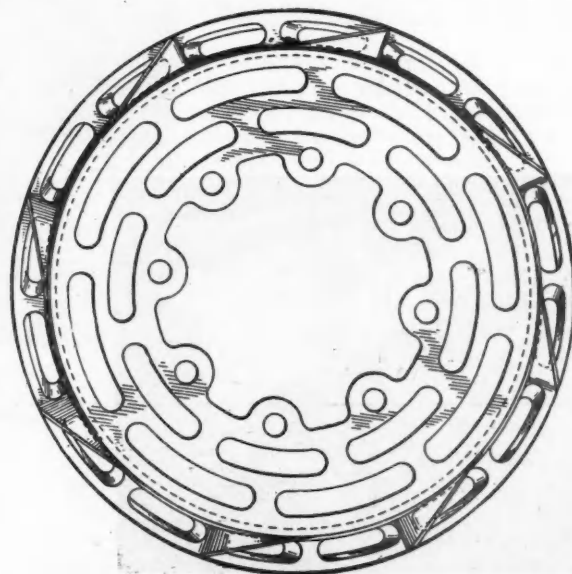
The Air Flow Custom Imperial is continued in the line. The engine in this model is available also with a special head giving a compression ratio of 7.45.

Transmissions of all Air Flow models have helical gears for all speeds, including the reverse, and they are also provided with synchronizers. All pistons are alumilited, as during the latter part of the 1934 season.

Brake Cooling Patent

REFERRING to our description of the fan-cooled truck wheel of Rogers Brothers Corporation of Albion, Pa. (*Automotive Industries* of Sept. 15) Stanley M. Udale of Detroit calls our attention to a patent on a fan-cooled brake drum issued to him on August 4, 1930, and assigned by him to the Erb-Joyce Foundry Company of Detroit. By a curious coincidence the two inventions, both of which are directed toward

the same object, were published within 11 days of each other. One of the drawings from the Udale patent is reproduced herewith. It will be seen that fan blades are cast onto the outside of the brake drum. In the Rogers Brothers wheel a fan designed to cool the brake drum is set into the rim of the wheel.



Plymouth Offers Six Body Types on 113-in. Chassis

(Continued from page 797)

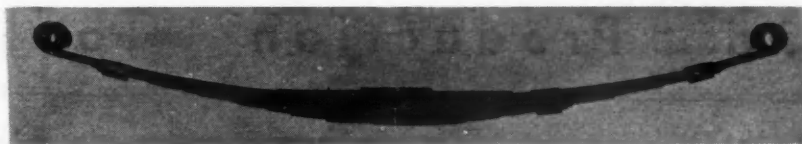
A synchronizer of the ball-detent type is now provided in the transmission for high and second speeds. Free-wheeling has been dropped.

The propeller shaft has been increased in diameter. Four bronze washers are now provided in the differential gear to take thrust loads and to make it possible to take up wear.

Brake cylinders of the hydraulic braking system now have a smaller bore for the piston connected to the front shoe than for that connected to the rear shoe, to compensate for the difference in the pressure of application of the two shoes due to the self-energizing effect. This tends to equalize the wear on the linings of the two shoes. This year all models have Centrifuse brake drums.

The all-steel bodies of the 1935 Plymouths are secured to the frames by means of 46 body bolts, as compared with only 18 last year, which increases the rigidity of the car as a whole. Besides, the bodies have been dropped down lower, the side panels fitting over the frame, to reduce the overall height. Seats are 3 in. wider, it is stated, while the floor has been lowered 3% in., to increase the leg room and head room.

Bodies have been improved in appearance both inside and out. Seams



The new springs are thinned down at the ends of each leaf, so that more area of the leaf comes into contact with the adjoining leaves, distributing the spring load. They are made of a new Mola steel, developed this year.

and braiding in the ceiling trim have been eliminated; there is a new instrument panel in the car, with ash receiver and glove compartment; broadcloth upholstery in patterns is standard, with mohair available on the deluxe models; ventilating wings have been eliminated and replaced with windows which are slid horizontally after being fully raised by means of a single crank arm; cowl ventilators have been enlarged and provided with screens.

All exterior metal parts are rust-proofed as previously, before lacquering.

The distinctive hood treatment will be noted from the accompanying photographs. In addition to the openings

shown, hood louvers are provided also under the front fenders.

A special manifold and carbureter assembly, designed specifically for fuel economy, is provided on the business coupe.

Other changes include a seasonal manual manifold heat control instead of the former automatic type, elimination of the crankshaft vibration damper, use of two oil rings and two compression rings instead of one and three respectively as formerly, development of new tappets with chrome-steel heads, alumilited aluminum pistons, steel starter ring gears shrunk to the fly-wheel, and a smaller rear axle ratio on sedans.

Brunemar Front-Wheel Independent Springing

THE accompanying photograph shows a Velie car belonging to W. T. Brunemar of Moline, Ill., which he has equipped with a front axle and front independent suspension of his own invention. The original front axle was replaced by parallel links pivoted to a frame bracket in the longitudinal center plane of the car and connecting to the steering knuckles by universal joints. The load is taken on coiled springs interposed between the frame and the axle links, and steering takes place around the axles connecting the centers of the universal joints on each side.

Mr. Brunemar (whose address is c/o Williams White & Co., Moline, Ill.) claims that the construction, although a first sample and somewhat crudely built, improves the riding and driving qualities of the old car, that it is simple and cheap to manufacture, that it gives a low-underslung, three-point suspension,



Brunemar front independent springing

and that the front wheels have a parallel motion and retain their vertical position regardless of spring action. The photograph shows the very considerable range of spring motion obtainable without perceptibly tilting the body of the car.

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

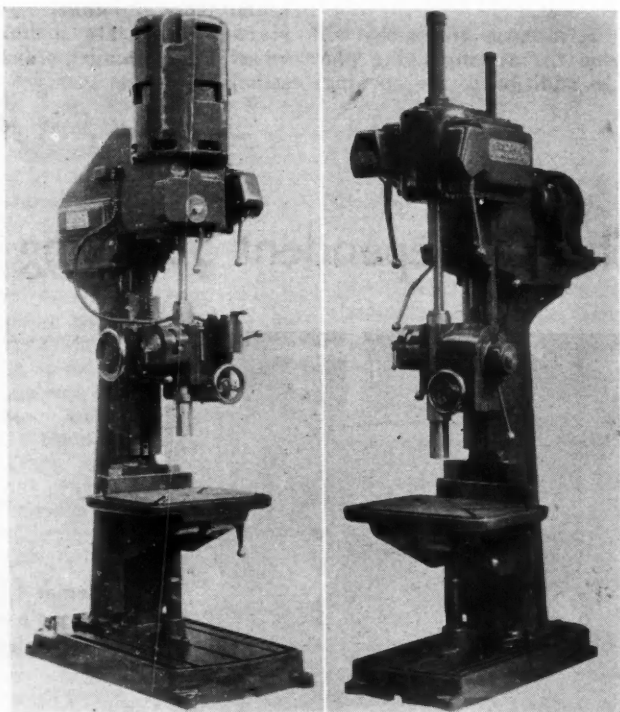
Upright Drills With Flexible Control

The Fosdick Machine Tool Co., Cincinnati, Ohio, has placed on the market two upright drilling machines of the Economax line. Both machines have the advanced features of this line but the machine in Fig. 1 has a motorized spindle while the machine in Fig. 2 has the conventional drive through gearing.

The motorized spindle upright, Fig. 1, is designed to meet the demand for single purpose operations, but can also be used for general drilling. Any number of spindle speeds from one to eight can be obtained with a range of 75 to 1800 R.P.M. One to nine feed changes can be had with a range of

twelve spindle speeds ranging from 60 to 1500 r.p.m. Spindle speeds and spindle feeds are obtained on both machines by single lever control, while running, the speed change lever showing the exact speed for each position.

Use of a positive clutch is said to make the tripping at a pre-determined depth absolutely accurate. After the feed is tripped, the spindle can be advanced by hand the remaining travel. An adjustable positive hand stop which can be set by a direct reading graduated dial, is supplied for accurate spot facing, counter-boring, or gap drilling. The graduated dial is located directly in front of the operator. This hand stop can be used for work where more than two depths are required. An interlock between hand and power feed stops prevents any possible chance of



.005 in. to .043 in. per revolution of spindle on both types. Larger feeds can be had if desired. All speed and feed changes obtained by means of single levers. Reverse to spindle for tapping is accomplished through a reversing switch located on the sliding head. This switch is also used to stop spindle instantly.

The geared spindle machine has

an accident if hand feed is set ahead of power feed.

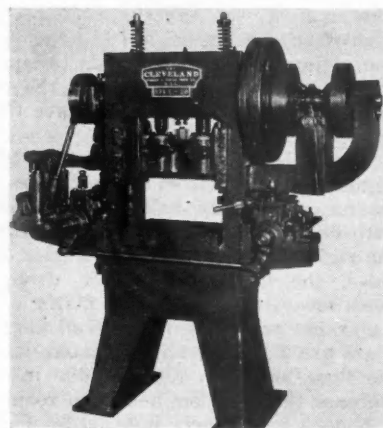
The Economax upright drill line is made in three sizes, 21, 25, and 30 in., the 25 in. machine being illustrated here. Floor space required is 28½ x 56 in. on the 21 and 25 in.; 34½ x 60 in. for the 30 in. Motor size is 3-5 hp., 5 hp., and 5-7 hp. respectively. Net weight ranges from 2000 to 3700 lb.

depending upon the type and size machine.

Any speed motor from 1200 to 1800 r.p.m. can be used on the gear driven machine. The motorized spindle upright can use a constant speed motor and when more than one spindle speed is required, a multi-speed motor is furnished with speeds of 450 to 1200 r.p.m., or 600 to 1800 r.p.m. A drum controller is furnished when using a multi-speed motor.

Cleveland Press Operates at 250 R.P.M.

High speed double eccentric all-welded steel frame press recently built by The Cleveland Punch & Shear Works



Company, Cleveland, Ohio, can be operated up to a speed of 250 r.p.m. It is equipped with a double roll feed and scrap cutter. The press is arranged for V-type belt drive and has a friction clutch and brake. The slide is provided with adjustment for use when setting dies. Cleveland presses of this type can be furnished in a wide range of sizes and capacities.

The Engine Keeps Itself Warm

An apparatus which will automatically start and stop the engine of a parked car periodically, to prevent the engine from becoming too cold and therefore hard to start in winter time, has been developed by Equipment Manufacturing, Inc., of Minneapolis, Minn., and will be marketed under the trade name Moto-Robot. It is controlled by a thermostat actuated by the temperature of the water in the engine cooling system, starting the engine up as soon as the temperature drops to 120 deg. and stopping it at 145 deg. The engine is thus run at intervals, and its temperature is maintained between these two limits. It will not start if the car is left in gear, and it is shut down instantly if the shift lever is moved from the neutral position, thus preventing accidents. As the ignition is locked while the car is parked the device serves also as a theft-retardant.

Among the advantages claimed for the apparatus are that it insures an instant start at all times without choking, makes heat from the car heater available instantly when starting off, helps to keep the battery fully charged, comprises an automatic cut-out which prevents exhausting the battery if the engine fails to start, and makes unnecessary the use of light oil for engine lubrication during the cold months. The apparatus can be used also to keep the engine warm in the garage, but when so used it is recommended to lead a tube from the tail pipe of the muffler to the outside, so no poisonous gases can accumulate inside. It is claimed that when the car is parked in cold weather the engine is kept running only 5 to 10 per cent of the time.

Hard-Faced Dies

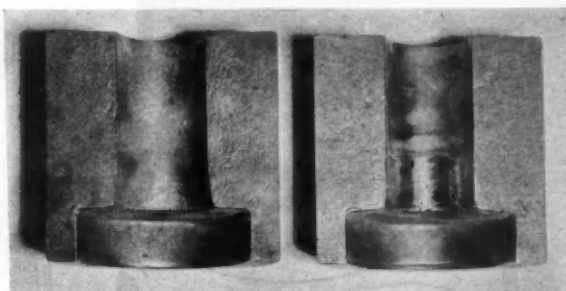
Hard-facing protects dies from wear. Notice the difference in wear between these dies for hot upsetting cluster gears for a prominent make of automobile. The die on the left, hard-faced with Stellite, is still straight after completing 18,000 forgings, whereas the plain steel die on the right is badly bell-

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

mouthered and unfit for further service after only 7000 forgings. Although expansion and contraction due to heat have slightly checked the hard-faced die, it can be quickly

reconditioned by simply melting together the hard-facing deposit and adding a little more wear-resistant alloy after which a grinding operation completes the job.



Photograph courtesy of Haynes Stellite Company.

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the sweeping acceptance Bendix-Westinghouse Equipment has met in the modern motor transport field. Featured as standard, by the world's foremost operators and manufacturers, Bendix-Westinghouse Control numbers among its most enthusiastic users those who have made their selection thru actual comparison with contemporary equipment.

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December 29, 1931

Automotive Industries

A



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developed by Federal-Mogul

TO MEET MODERN ENGINE REQUIREMENTS

Cadmium-silver-copper is a new bearing alloy, developed and perfected by Federal-Mogul, and already adopted by four automotive manufacturers. It brings very definite advantages over other bearing metals, since it withstands the higher temperatures encountered in modern high-speed engines, and also provides greater protection against crankshaft wear. The use of Federal-Mogul cadmium-silver-copper bearing alloys meets cost requirements and entails no assembly problems. Briefly, the outstanding advantages are:

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Possesses higher physical properties than tin-base metals at all operating temperatures.

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Automotive Products and Factory Equipment Manufactured by Advertisers in This Issue

See Alphabetical List of Advertisers on Page 36

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December 29, 1934

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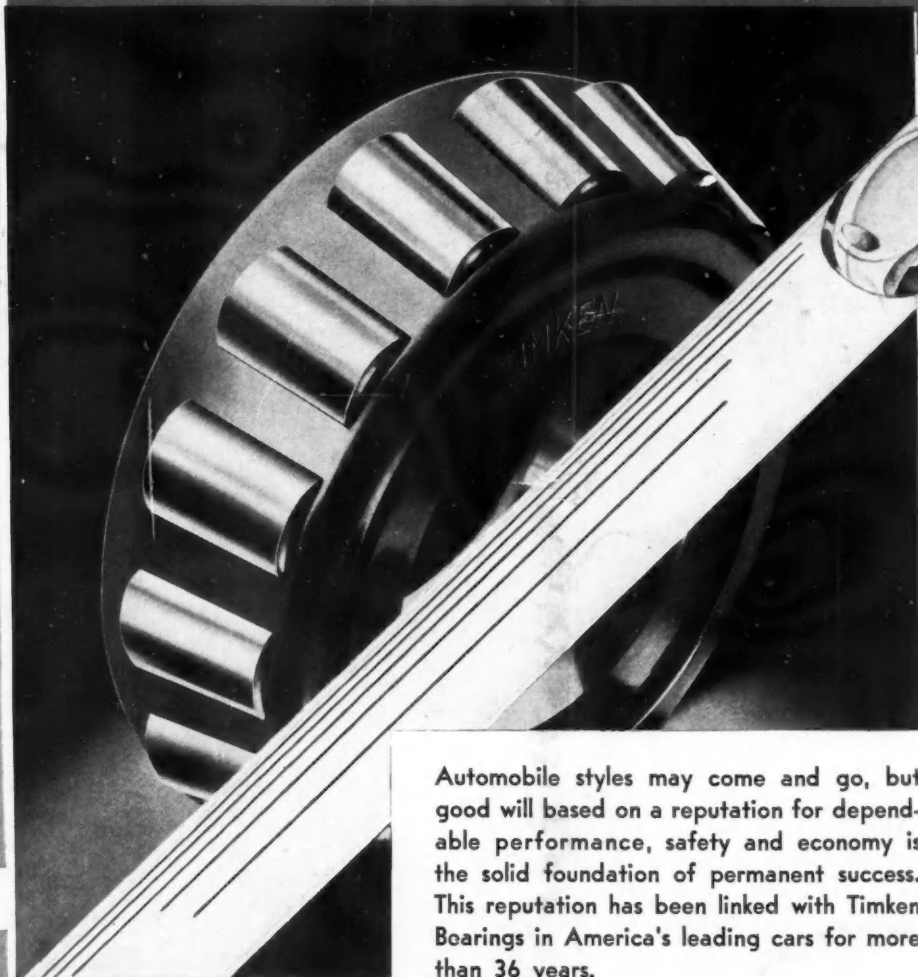
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AUTOMOTIVE INDUSTRIES

LAND — AIR — WATER

DECEMBER 29, 1934

Linking Style with Performance in America's Leading Cars



Automobile styles may come and go, but good will based on a reputation for dependable performance, safety and economy is the solid foundation of permanent success. This reputation has been linked with Timken Bearings in America's leading cars for more than 36 years.

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Austin	..x.	..x.	..x.	..x.	..x.
Cadillac	..x.	..x.	..x.	..x.	..x.
Chrysler	..x.	..x.	..x.	..x.	..x.
Cunningham	..x.	..x.	..x.	..x.	..x.
DeSoto	..x.	..x.	..x.	..x.	..x.
Dodge	..x.	..x.	..x.	..x.	..x.
DuPont	..x.	..x.	..x.	..x.	..x.
Ford	..x.	..x.	..x.	..x.	..x.
Franklin	..x.	..x.	..x.	..x.	..x.
Graham	..x.	..x.	..x.	..x.	..x.
Hudson	..x.	..x.	..x.	..x.	..x.
Hupmobile	..x.	..x.	..x.	..x.	..x.
LaSalle	..x.	..x.	..x.	..x.	..x.
Lincoln	..x.	..x.	..x.	..x.	..x.
Marmon	..x.	..x.	..x.	..x.	..x.
Nash	..x.	..x.	..x.	..x.	..x.
Pierce-Arrow	..x.	..x.	..x.	..x.	..x.
Plymouth	..x.	..x.	..x.	..x.	..x.
Reo	..x.	..x.	..x.	..x.	..x.
Studebaker	..x.	..x.	..x.	..x.	..x.
Stutz	..x.	..x.	..x.	..x.	..x.
Terraplane	..x.	..x.	..x.	..x.	..x.
Willys	..x.	..x.	..x.	..x.	..x.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN *Tapered Roller* BEARINGS

CONNECTING RODS

Accurately prepared for liners on

HEALD MACHINES

MANUFACTURERS, realizing how important it is to have the crank end of the connecting rod finished to close accuracy and fine finish before inserting the liner, have selected Heald Gage-Matics for the bore and Heald Surface Grinders for the sides.

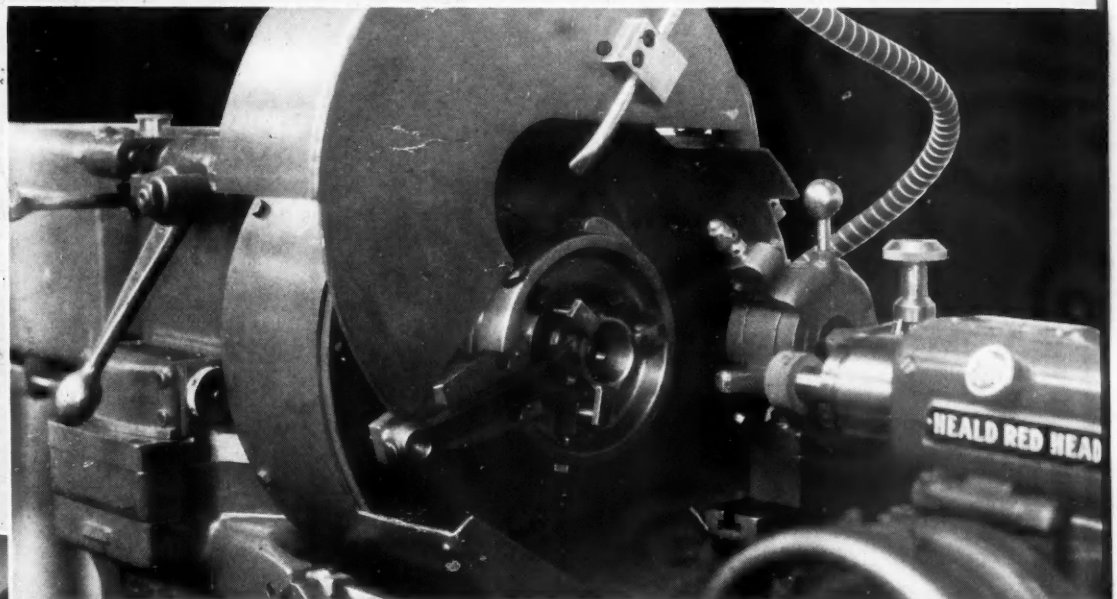
Several different plants have installed this equipment for these operations with one man running two Surface Grinders grinding both sides of 100 to 120

rods per hour. The Gage-Matics are grinding the bores at varying rates from 70 to 85 pieces per hour, some cases with one operator running two machines.

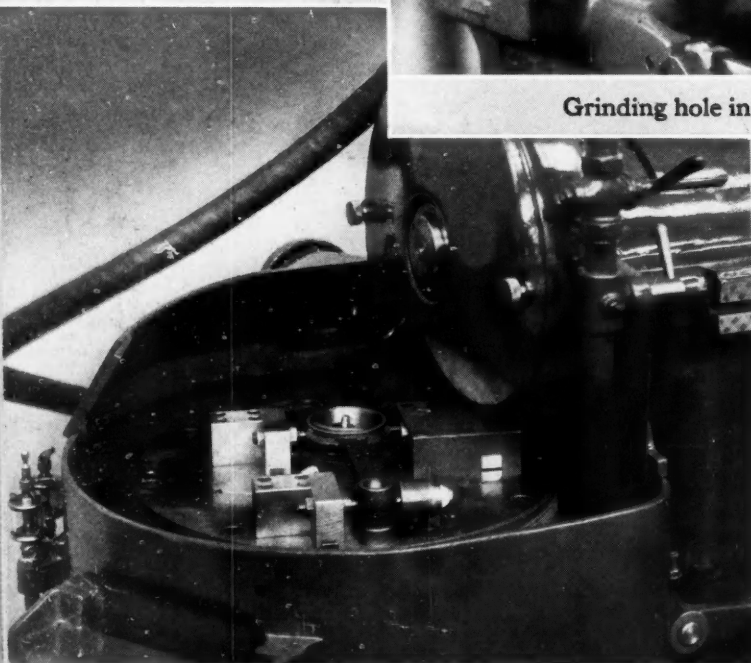
The concentric finish and consistent accuracy of the Heald Rotary Surface Grinders and the well known positive gaging and rapid operation of the Gage-Matic make these machines ideal for this application of connecting rod finishing.

Leading manufacturers who are using HEALD MACHINES for this work . . .

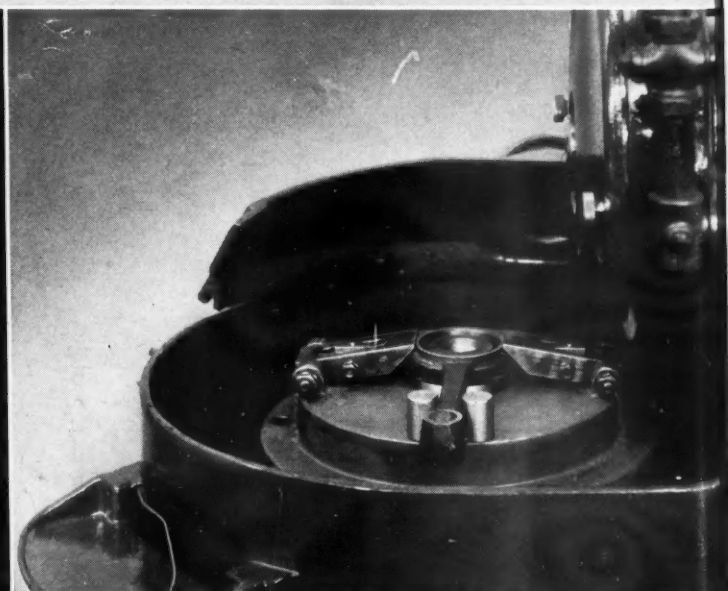
Cadillac
Chrysler
Ford
Hupmobile
Packard
Pontiac
Studebaker
White



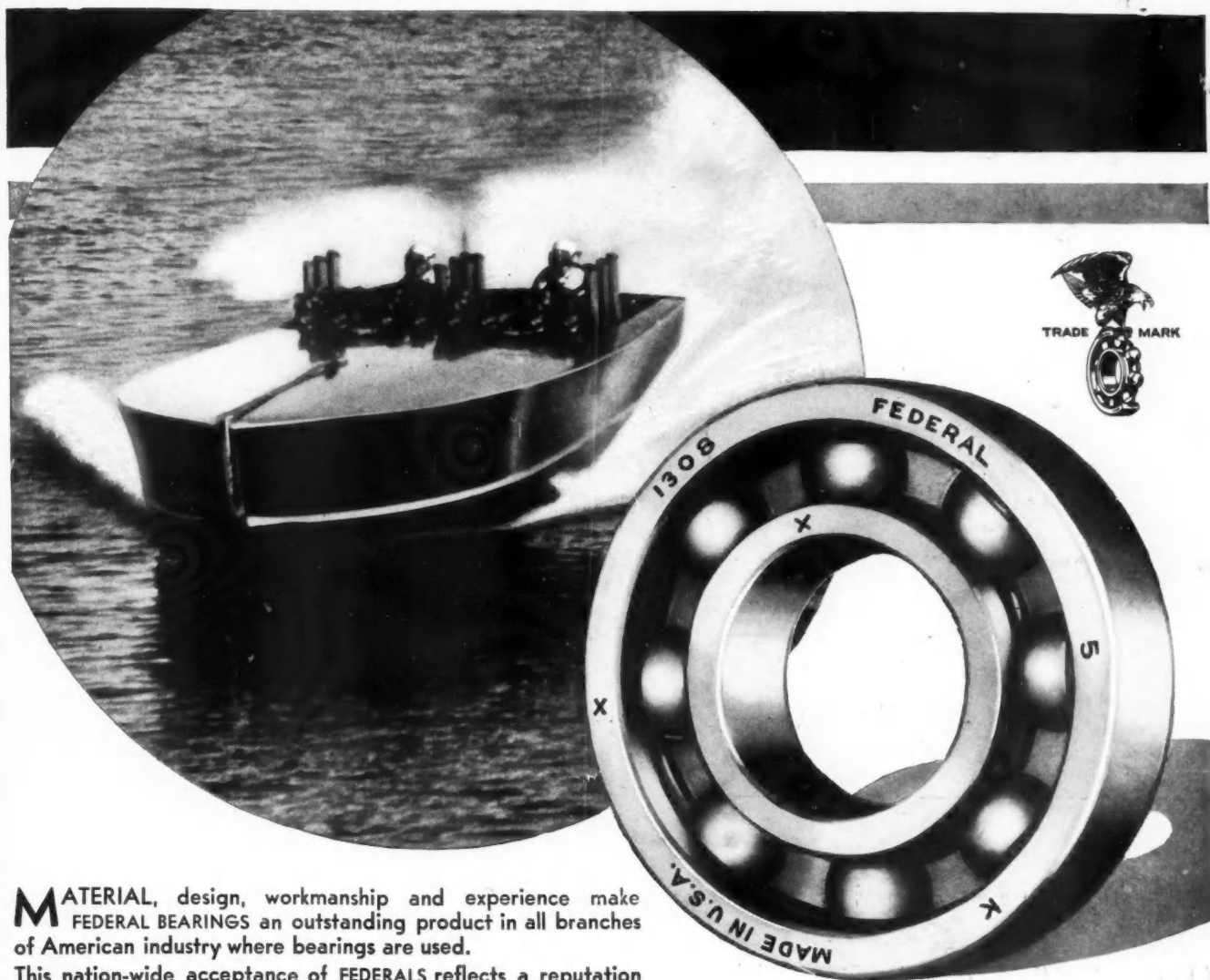
Grinding hole in connecting rod located from ground side and rough bore



Grinding first side of connecting rod locating from centers



Grinding second side of connecting rod located from first



MATERIAL, design, workmanship and experience make FEDERAL BEARINGS an outstanding product in all branches of American industry where bearings are used.

This nation-wide acceptance of FEDERALS reflects a reputation for quality attained during many years of experience in the manufacture of fine ball bearings.

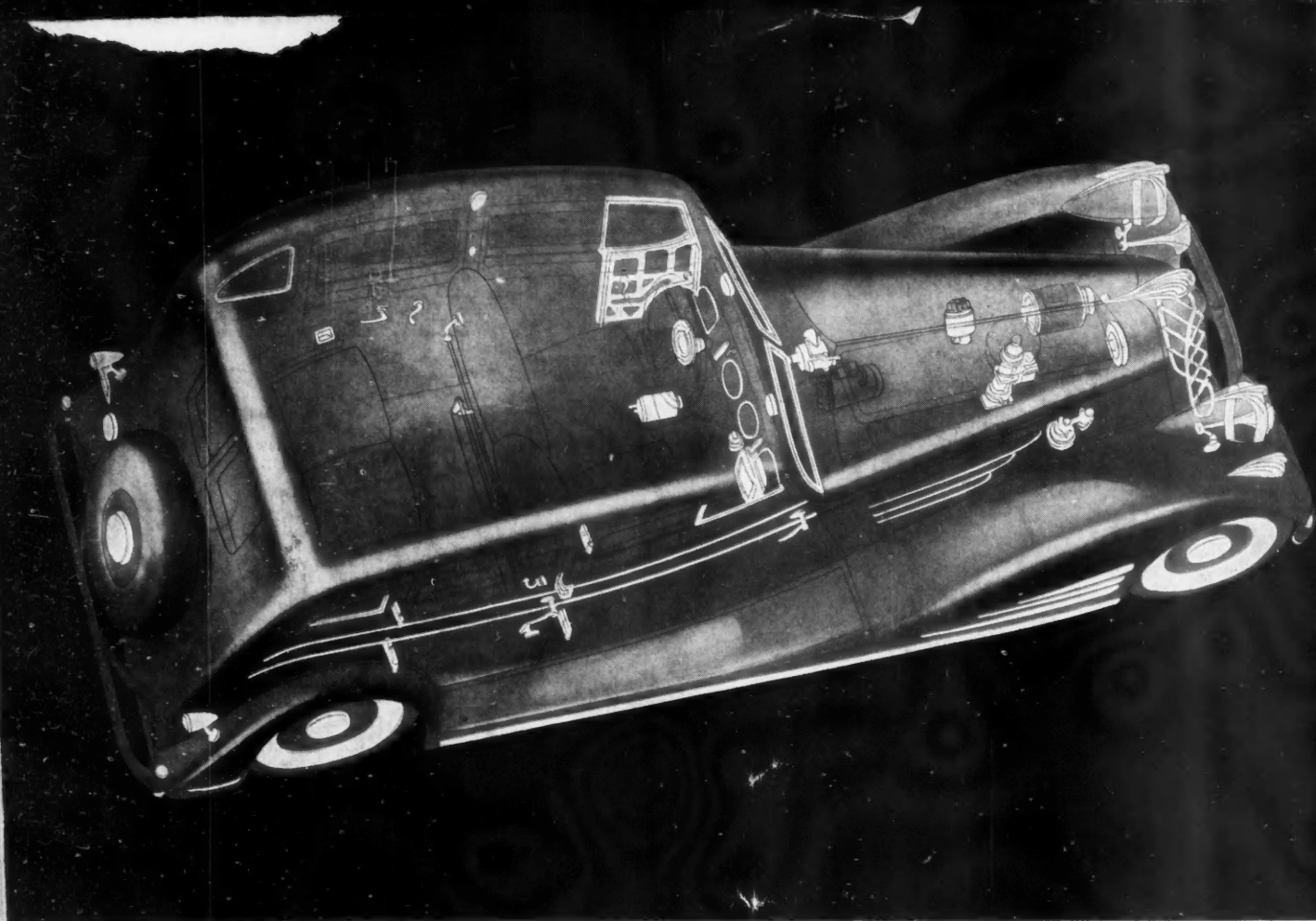
Those who insist upon dependable performance invariably select FEDERAL BALL BEARINGS.

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DIE CASTINGS

The increasing use of this material and this method of fabrication in automotive manufacture should be decisive proof of two facts: (1) ZINC Alloy Die Castings are dependable and, (2) their use is inherently economical. Those are the fundamental questions automotive metallurgists, design engineers, and production men must answer. Their extensive use of ZINC Alloy Die Castings should be the best indication of their answer to these questions.

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